# RISC user

DECEMBER 1993
Volume 7 Issue 2
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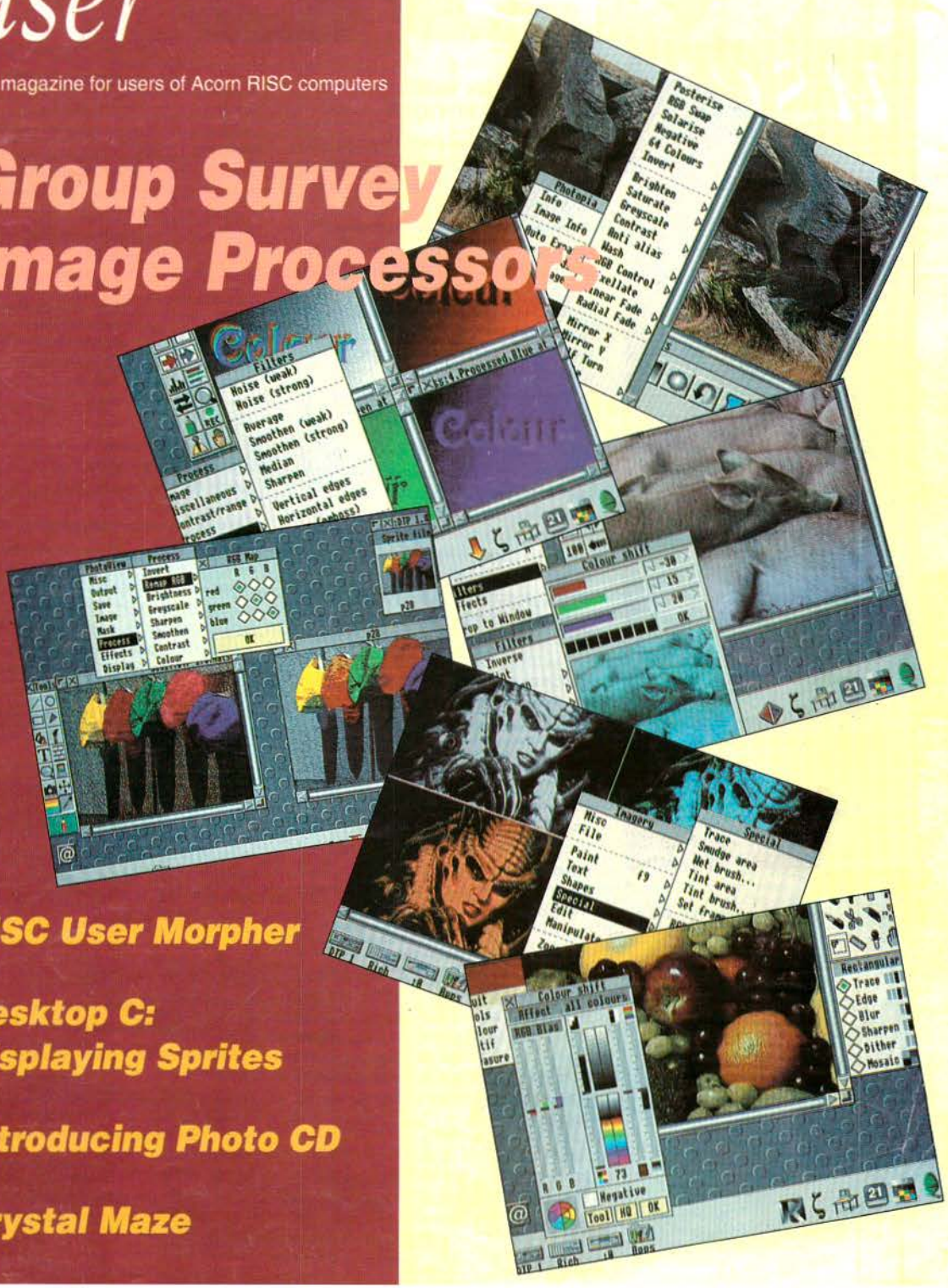
The magazine for users of Acorn RISC computers

## Group Survey
## Image Processors




**RISC User Morpher**

**Desktop C:**
**Displaying Sprites**

**Introducing Photo CD**

**Crystal Maze**

DECEMBER 1993
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# RISC user

THE MAGAZINE FOR USERS OF ACORN RISC COMPUTERS

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## THE ACORN WORLD IN 1993 - SOME REFLECTIONS

As 1993 draws to a close, many people in the Acorn market will draw a massive sigh of relief that their companies have emerged relatively unscathed from a recession that has seriously damaged large sections of the computer industry. In fact, 1993 may go down as the best year ever for the Archimedes. After twelve years in schools, colleges and universities, Acorn has finally graduated, and entered the wider and more challenging worlds of home entertainment, multimedia, desktop publishing and office productivity.

Whereas IBM and Apple have found themselves locked in a dangerous battle for customers and sales, both between themselves and with numerous cut-price competitors, Acorn and its supporting hardware and software developers and companies have enjoyed an almost unprecedented period of growth, both at home and internationally. Acorn now has branches in Australia, New Zealand, Germany and Canada, and an extensive distribution network in numerous other countries. Software developers are also bringing out foreign language versions of their programs to an extent not seen previously, and in many cases at the same time or soon after the launch of English language versions. Locally, Acorn has undergone a radical transformation from a primarily research and development orientated company to one in which the targetting and marketing of products is now recognised as essential for any successful and effective company. Although at first sight these developments may seem to have little direct bearing on the average Acorn user, their results are rapidly becoming visible. As the Acorn user base increases, so too does the quality and quantity of products from existing companies, and the number of companies entering the Acorn market for the first time.

And what then of Acorn World '93? It promised much, but what did it deliver? The answer is very simple - Acorn's *Vision for the future*. It produced a considerable amount of interest, enthusiasm and excitement, both for visitors and exhibitors. It saw the launch of many new products, ranging from professional broadcasting systems costing thousands of pounds to Wild Vision's and Computer Concepts' incredible *Eagle Mk2* multimedia expansion card, and from software such as *Sibelius 7*, rated by professionals as one of the best music typesetting programs available, to a large number of fantastic games and entertainment programs, the quality of which has rarely been seen on the Archimedes before. Although many of the demonstrations running in the Concept Gallery may have looked fairly innocuous, if you watched carefully you may have realised that they certainly weren't being run on the systems that you or I use.

There were many memorable aspects to the show - the jugglers and face painters, Sam Wauchope abseiling down the tower, and the Crystal Maze theme tune playing incessantly. Yet many people may also have left slightly disappointed - Acorn didn't launch a single new computer, Computer Concepts didn't have *Impression Style* ready, the PhotoCD software was unavailable, and where were *Lemmings 2* and *Wing Commander*?

Acorn World '93 was all about the future. Without doubt it was the best show the Acorn community has ever seen. We have now left the past, and seen Acorn's vision for the future. Perhaps next year will see the fulfilment of that vision - let us hope so.

M.C.W.

## ANNOUNCEMENTS

The BEEBUG Showroom will be open until 8pm on Thursdays until further notice.

Although we have recently installed a new telephone system, the main number for Beebug remains the same (0727 840303). However, there is now a separate number for RISC Developments (0727 843600), and you can telephone direct to our sales staff for placing orders using 0727 840305. We are also increasing the number of lines to cope with all your calls.

# CONTENTS


## FEATURES

| | |
|---|---|
| *Group Survey: Image Processors* | 7 |
| *Desktop C: Displaying Sprites* | 13 |
| *Introducing Photo-CD* | 23 |
| *Educational Software at Home (Part 3): Science and Technology* | 30 |
| *A New Look for your Desktop* | 33 |
| *Desktop Debugging* | 34 |
| *What's Cooking at Clares* | 38 |
| *Into the Arc: Expanding your Horizons* | 42 |
| *The PC Emulator Survival Guide (Part 9)* | 47 |
| *Wimp Topics: Interactive Help* | 51 |
| *Good Impressions: Borders* | 58 |
| *C Notebook: Hints and Queries* | 65 |

## UTILITIES AND APPLICATIONS

| | |
|---|---|
| *The RISC User Morpher* | 20 |
| *Beat the VAT Man* | 66 |
| *Icon Labeller* | 70 |
| *Boffin* | 71 |

## REVIEWS

| | |
|---|---|
| *A Telescope on your Screen: Clares' NightSky* | 17 |
| *Rhapsody 3* | 25 |
| *SyQuest 105Mb Removable Hard Drive* | 28 |
| *Enter the Crystal Maze* | 36 |
| *Explore with Flossy the Frog* | 45 |

## REGULARS

| | |
|---|---|
| *News* | 4 |
| *RISC User Disc Contents* | 40 |
| *Hints and Tips* | 54 |
| *Technical Queries* | 62 |
| *Write-Back* | 67 |
| *RISC User Subscriptions* | 74 |
| *Classified Ads* | 75 |
| *Advertisers' Index* | 75 |

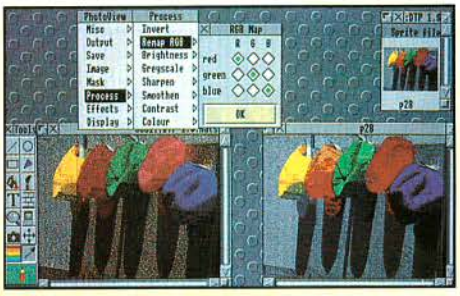
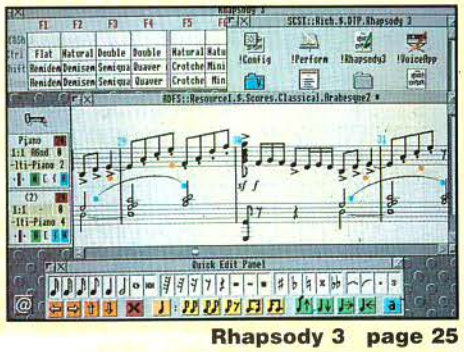



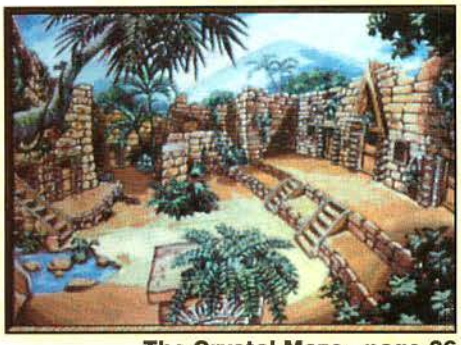
**Image Processor Survey page 7**

**NightSky page 17**

**RISC User Morpher page 20**



**Rhapsody 3 page 25**

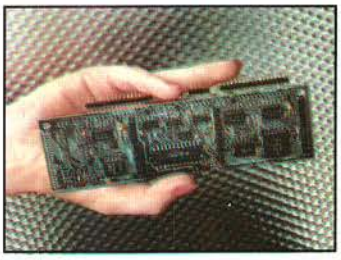


**The Crystal Maze page 36**

# News ...

## CUMANA AND SEMERC LAUNCH A4000S UPGRADE KIT

Cumana and SEMERC have introduced the A4000S Upgrade Kit, following calls from schools keen to upgrade their existing A4000 machines to the level of the A4000S Special Needs plug-in-and-go computer system. The new pack comprises Cumana's Expandable Multi Use (EMU) base board and user port, together with the full range of A4000S software, documentation and manuals.



The EMU and user port enable devices such as overlay keyboards, switch boxes, control equipment and turtles to be connected to the computer using existing leads. The interface also allows for further expansion for SLCD, MIDI, analogue, SCSI, IDE and other third party boards. The A4000S Upgrade Pack costs £119 ex. VAT, and is available from Cumana at Pines Trading Estate, Broad Street, Guildford, Surrey GU3 3BH, tel. 0483 503121. The pack is also available from Northwest SEMERC on 061 627 4469.

## PEER-TO-PEER NETWORKING FROM ACORN

Acorn previewed its new peer-to-peer entry level networking technology at Acorn World '93. A peer-to-peer network is one in which a number of systems can be linked together without the need for a fileserver. The system, part of Acorn's Universal Networking portfolio, AUN, should be available in early 1994, and has been designed for people who are taking their first steps into networking. It will allow any number of Acorn 32-bit systems to be connected in a peer-to-peer network, with sharing of printers and hard drives totally transparent.

## CARTOON CAPERS

LOOKsystems, the company behind *Archimedes Disc Rescue* and the *Monotype Font Collection*, has secured the conversion rights to the *Bitfolio Cartoon Graphics* collection, until now available only for the Mac and PC. The collection consists of over 100 full colour cartoon characters in Draw file format, and is supplied on 3 discs. The collection costs £30 inc. VAT, and is available from LOOKsystems at 47 Goodhale Road, Bowthorpe, Norwich NR5 9AY, tel. 0603 748253.

## THE FASTEST ARM YET

ARM Ltd has officially launched the new ARM7 processor. Said to run at double the speed of the 33MHz ARM3 processor used in the new A5000, the ARM7 processor has features such as a digital signal processor, DSP, and an 8K instruction cache, double that of the current ARM processors. The ARM7 is the successor to the ARM6 processor, which has already been used very successfully in Apple's Newton PDA and the 3D0 Interactive games/multimedia system. Other ARM7 developments include the ARM7DM architecture, which includes a very fast hardware multiplier for DSP applications, and the ARM7D, for developers wishing to integrate ARM7 silicon into their own chips. It is a reasonable guess that Acorn's next generation of computers will use the ARM7 processor, and combined with the new VIDC20, these computers should be pretty stunning.

## ACORN VIDEO MINEFIELD

Acorn has walked straight into a minefield with *The Home Computer Minefield Video*. So much so, in fact, that it's had to withdraw the video from distribution. Commodore, the Amiga company, took out a temporary High Court injunction against Acorn for implying that the Amiga does not run office applications, personal productivity or education software. Well of course the Amiga can run these types of applications. Even the Spectrum could. Though who would quite want to use a Spectrum nowadays for these purposes is another matter. Mike O'Riordan, Sales and Marketing Director at Acorn, said that Acorn decided not to contest the ruling at the second hearing, as it did not wish to enter into a protracted legal argument with Commodore.

## ACORN USER CHANGES PUBLISHER

Acorn User, probably the most widely read Acorn computer magazine, has recently been sold by Redwood Publishing to Europress, the publishers of Acorn Computing. Europress plans to continue publishing Acorn User alongside Acorn Computing, and has appointed Mark Moxon, former technical editor of RISC User and until now technical editor of Acorn User, as editor of the new Acorn User. Our congratulations and best wishes to Mark.

## NEW MONITOR FROM ACORN

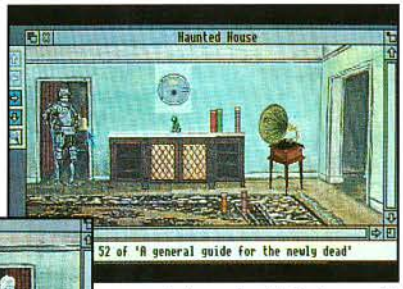
Acorn, in association with the well known monitor manufacturers, Microvitec, has released a new high resolution Super VGA monitor for the Archimedes. The AKF50 has a 0.28 dot pitch, complies with all European ergonomic and safety regulations, and supports all Acorn screen modes up to SVGA standard. Priced at £374 inc. VAT, or for an additional £75 inc. VAT above the standard Acorn Multiscan system price, the monitor is available from all Acorn dealers.

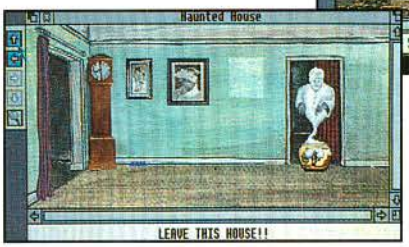
## ArtWorks MADE EASY

Dabs Press has recently added yet another title to its ever increasing range of *Dabhand Guides*. Written by Roger Amos, *ArtWorks Made Easy* is intended for the newcomer to ArtWorks, taking the reader through the many features of the application, the utilities supplied with it, and the principal differences between *ArtWorks* and *Draw*. *ArtWorks Made Easy* costs £14.95, and is available from Dabs Press, 250 Leyland Lane, Leyland, Preston PR5 3HL, tel. 0772 623000, and most computer dealers.

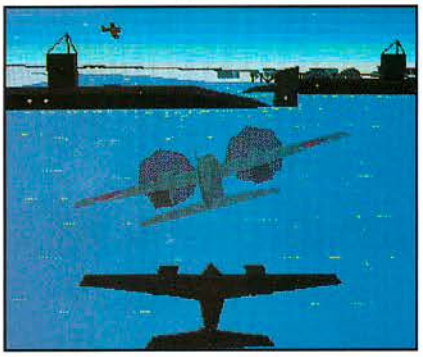
## CHRISTMAS BONANZA FROM THE FOURTH DIMENSION

The Fourth Dimension has released no less than four new games, the first of which is *Haunted House*, a Desktop graphic adventure game with a touch of the supernatural. Employed to recover a large number of miscellaneous antiques and collectables from a deserted old house, you'll find yourself faced with many challenging puzzles and several deceased inhabitants who are intent on foiling your every move. *Haunted House* costs £25.95 inc. VAT.




*Birds of War* is a flight simulator like no other. With *Birds of War*, you have the chance to fly any one of thirty-two famous and realistically modelled aircraft spanning the entire history of aviation. Take to the skies in a Sopwith Camel, a Spitfire, an F-16 or even the latest Stealth Fighter, tackling over 192 missions covering over 250 000 square kilometres. Supplied on 6 discs, and requiring about 4.5Mb of hard disc space, although it can run off floppy disc, *Birds of War* costs £34.95 inc. VAT.



Originally advertised about two years ago, and then mysteriously cancelled, *The Exotic Adventures of Sylvia Layne* has finally arrived. Your mission is to find the exact whereabouts of the brilliant and mad Greek geneticist, Marcus Mousacca, who has been kidnapped by the terrorist organisation, POLAR (Peoples Organisation for the Liberation of the Animal Race). It is believed that he may have been attempting to mix the genes of sheep and kangaroos in an attempt to create a "woolly jumper". *The Exotic Adventures of Sylvia Layne* is a massive arcade adventure game, in which you must visit Aztec Temples, construction sites in New York, and the Houston Space Centre, collecting maps and clues along the way, and fighting off hordes of baddies. *The Exotic Adventures of Sylvia Layne* costs £25.95 inc. VAT.

Last, but not least, is *Carnage Inc.*, a 3D isometric game. The action takes place in the year 2297, and with all weapons of war banned, the threat of invasion from a hostile alien empire forces the ruling council to commission Carnage Inc. to fight the war for them. They build you: a Cyberkill Mk.III Battle Droid. Your mission is to infiltrate and annihilate the enemy power. *Carnage Inc.* costs £25.95 inc. VAT. For more information on these games, contact The Fourth Dimension at 1 Percy Street, Sheffield S3 8AU, tel. 0742 700661.

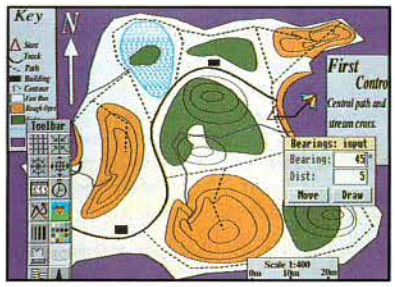
## ACORN CUTS PRICE OF PC COMPATIBILITY

Acorn has announced considerable price reductions for its PC cards, developed by Aleph One, for the A3020 and A4000 series computers. The prices for the 386 and 486 cards have been reduced by £50, and the combined A4000/PC card system is £100 cheaper. In addition, the PC card software, which integrates the PC environment into RISC OS, has been improved. This new software is available free to all existing owners of Acorn PC cards, and can be obtained by returning the original Acorn PC Card Software disc, in an envelope marked "PC Card Upgrade", to Customer Services, Acorn Computers Ltd, Acorn House, Vision Park, Histon, Cambridge CB4 4AE, tel. 0223 254 254.

## THE ULTIMATE CD DRIVE

In a surprise move, Computer Concepts has launched its own CD-ROM drive system. The Pioneer DRM-604X is a quad speed drive that supports a transfer rate of 614Kb/s. Not only is it blindingly fast, it also has a six-disc magazine and autochanger, thus doing the job of six separate CD-ROM drives. Add to this the fact that it's multi-session PhotoCD compatible, can play your standard audio compact discs, is suitable for any Archimedes with a SCSI interface, and comes with a free copy of Computer Concepts ArtWorks clip-art CD, it's an absolute bargain at £999 ex. VAT. For more information, contact Computer Concepts at Gaddesden Place, Hemel Hempstead, Herts HP2 6EX, tel. 0442 63933.

## A TREAT FOR GEOGRAPHERS




Following in the footsteps of Clares *Topographer*, Topologika Software has released *Navigator*, a content-free application to develop navigation and mapping skills. *Navigator* is unique in that it allows you to navigate around any kind of picture, from a simple Draw file diagram of the classroom to a massive Sprite file converted from a weather satellite image. Numerous navigation methods are supported, you can calibrate the scale of movement on the map, and each map can have a "link point", which causes a message to be displayed or another map to be loaded when you reach that location. Navigator costs £55.38 inc. VAT, and is available from Topologika Software at P.O. Box 39, Stilton PE7 3RL, tel. 0733 244682.

## SNARTLEFISH BAITING ON SOLUMUS MAJOR

Snartlefish baiting on Solumus Major is one of the more exciting, if not totally obscure, regional activities in our galaxy. However, nothing in the galaxy can compete with the exhilaration, frustration, and elation aroused by the ultimate challenge: *Phaethon*. So much for the blurb. If *Phaethon*, the *Fervour*-like game from Sinusoidal Tendencies and System Interrupt, doesn't make you go totally sinusoidal, then nothing will. Requiring razor sharp reflexes and nerves of steel to negotiate the 140 levels, and boasting over sixty minutes of original music and a powerful level editor, *Phaethon* costs £22.08 ex. VAT, and is available from System Interrupt at Burcott Manor, Wells, Somerset BA5 1NH, tel. 0749 670058.

## FAMILY FUN FROM CUMANA

Cumana has launched two new special price CD-ROM packs for home users and families, comprising a CD-ROM drive and a selection of software chosen specifically for its enjoyment and educational value. Known as the Family Fun/Education packs, Pack 1, priced at £499 inc. VAT, contains Cumana's latest 300 series CD-ROM drive and the CD-ROM title *Dictionary of the Living World*, *Creepy Crawlies*, *Image Warehouse*, and *Grooves*. Pack 2, at £599 inc. VAT, includes the contents of Pack 1 plus the CD-ROM titles *The World of Number: Who stole the Decimal Point?*, and *The Times and Sunday Times CD-ROM*. For more information, contact Cumana at Pines Trading Estate, Broad Street, Guildford, Surrey GU3 3BH, tel. 0483 503121. The packs are also available from Beebug and other Acorn dealers.

## LOTS MORE FUN AND GAMES

*Lots More Fun And Games* is a three-disc compilation of educational games from HS Software. Aimed at children from 5-9 years old, the games are suitable for National Curriculum maths and English, and include *Gwyn's World*, which involves identifying 2D and 3D shapes, *Dataday*, where a time traveller helps children learn the days of the week and months of the year, and *Spot the Blot*, for helping children develop visual perception skills. *Lots More Fun And Games* costs £22.95 inc. VAT. For more information, contact HS Software at 56 Hendrefoilan Avenue, Sketty, Swansea, West Glamorgan SA2 7NB, tel. 0792 204519.

## LaserDirect PRICES SLASHED

Computer Concepts has announced a dramatic price cut in its LaserDirect range of printers, as well as launching its RISC OS 3 LaserDirect software and a special *Impression* bundle offer.

In an attempt to compete with the ever decreasing prices for lasers in the Mac and PC markets, the price of the LaserDirect HiRes4 has been cut from £999 ex. VAT to £799 ex. VAT, and the HiRes8 from £1495 ex. VAT to £1099 ex. VAT. The LaserDirect RISC OS 3 software works with the RISC OS 3 Printer Manager, *Printers*, and supports rotated text, PostScript-like control over half-tone screens, and can also be used to print separations from any suitable application. The software is free to all existing users, and will be supplied as standard with all LaserDirect printers in the future.

As an added incentive, Computer Concepts will include a free copy of *Impression II* with every LaserDirect printer sold between now and Christmas.

## LONGMAN GOES WILD

Longman Logotron and Wild Vision have teamed up to supply an impressive video/image processing system. The package consists of Wild Vision's ScanLight Video 256 video digitiser/scanner, and Longman Logotron's *Revelation imagePro* professional image processing software. The package costs £299 ex. VAT, and is available until the end of the year. For further details, contact Longman Logotron at 124 Cambridge Science Park, Milton Road, Cambridge CB4 4ZS, tel. 0223 425558, or Wild Vision at 15 Witney Way, Boldon Business Park, Boldon Colliery, Tyne and Wear NE35 9PE, tel. 091 519 1455.

## DeskEdit 3 LAUNCHED

Risc Developments has just launched DeskEdit 3, successor to the popular DeskEdit 2 program and text editor.

DeskEdit 3 retains all the features of its powerful predecessor, while adding many more - for details of these turn to page 73 of this issue.

DeskEdit 3 is available now, and still costs £26.95 inc VAT for RISC User members. The upgrade from DeskEdit 1 costs £9.95 inc. VAT, and from DeskEdit 2, £5.88 inc. VAT. If you are upgrading please send your master disc with your order. To order contact RISC Developments at 117 Hatfield Road, St Albans, Herts AL1 4JS, tel. 0727 840303.

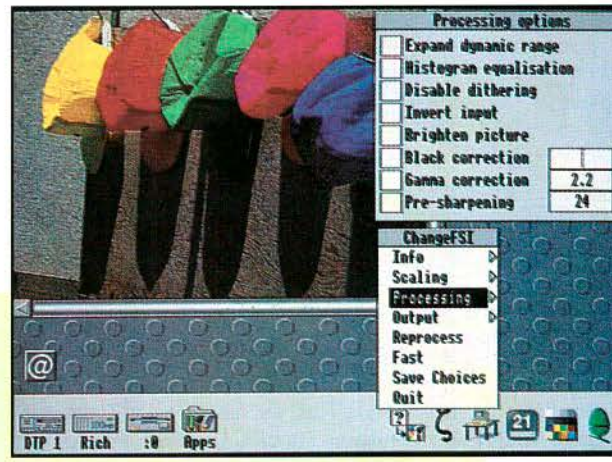
# Group Survey - Image Processors

*Spoilt for choice when it comes to image processing? Richard Hallas has the answers, and some surprising conclusions.*

The field of image processing is a large one, covering many areas and potential uses from the simple touching-up of sprites produced by hand-scanners to the digital processing and enhancement of satellite images. Of course, not all Acorn users aspire to such dizzy heights, and image processing packages are often used for cleaning up scanned or digitised pictures, and creating special effects.

The capabilities of such packages in the Acorn sphere vary widely, both in terms of the kind and number of features they offer and whether or not they do anything else as well. There are several combined processing and painting packages, a few conversion and processing packages, and a handful of programs which were created with specific hardware in mind.

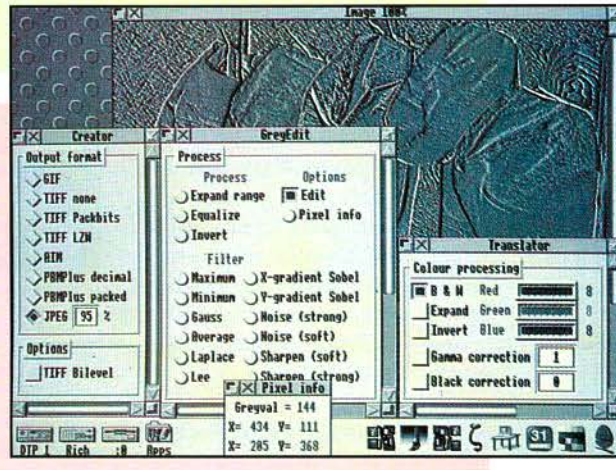
A surprising number of the contenders are either free or very cheap. The question is, can shareware packages deliver the capabilities and power that you would expect of software from full-price commercial offerings, and can any of the packages deliver the kind of results you would expect from similar software on other platforms?




## ChangeFSI
### version 0.915

Roger Wilson's conversion/processing package has been around for almost as long as the Archimedes itself. Primarily intended for converting foreign images into sprites, it nevertheless offers a number of image enhancement facilities.

The image processing options provided by ChangeFSI are powerful if not especially numerous, with an emphasis on the practical rather than the gimmicky: there are comprehensive options for altering the red, green and blue components of the picture individually, sharpening and enhancing edges, and more drastic options for getting at detail which might otherwise be lost (using histogram equalisation). The image processing options can only be applied to the whole image at once, which is reasonable given that the program is intended for either converting foreign files or improving newly scanned or digitised images.



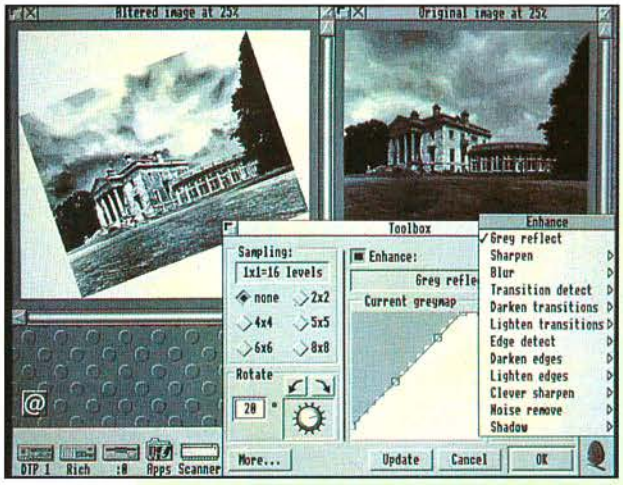

## Translator Suite
### Translator 7.21; GreyEdit 1.35; Creator 1.42

John Kortink's shareware program, Translator, resembles ChangeFSI in general purpose and capabilities if not in presentation. As its name suggests, its primary purpose is to convert images in foreign formats into sprites. Its image processing options are very similar to those provided by ChangeFSI, although it lacks ChangeFSI's brighten, sharpen and histogram equalisation capabilities.

Translator is part of a suite of three programs, the second of which is GreyEdit. GreyEdit is a powerful and useful program. It contains twelve image processing filters for sharpening, noise removal and other effects such as 3D 'contour'-type image creation, and in addition has three straight processing options for expanding the range of the image, inverting it and performing histogram equalisation.

The suite is completed by Creator, which turns Sprite and Clear files into various foreign file formats. Together, the high-quality, well-supported utilities in this suite provide an essential set of functions for anyone who wants to translate images between computer systems.

For a more comprehensive evaluation of both ChangeFSI and Translator, see *Working with Images* in RISC User 6:6.




## ScanLight Plus version 2.01

Computer Concepts' scanners have, for some time now, all been supplied with the same highly-acclaimed ScanLight Plus software, which is a grey-level image processing package with a great many options. ScanLight Plus provides a comprehensive grey-map editor that lets you edit the mapping between black and white for every grey level in your image, no matter how many there are, and you can draw a 'graph' in either straight lines or curves which the grey levels will follow.

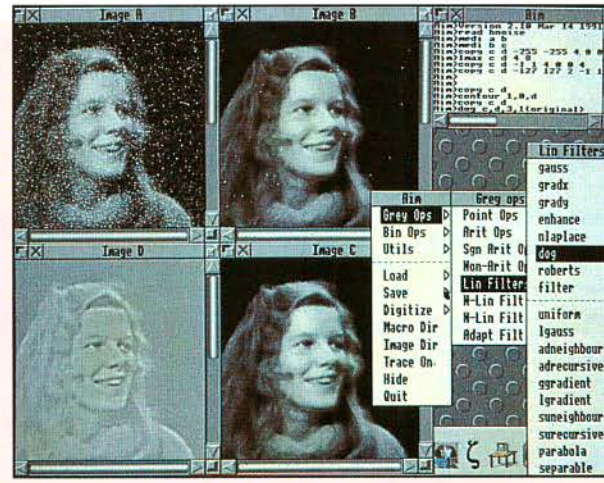
A wide range of image processing filters is provided: 34 of them in all, in 12 categories, all but one of which provide three levels of intensity. The ScanLight software is fast, easy to use and very powerful. Its biggest drawback is that you can only obtain it by purchasing a scanner or digitiser from Computer Concepts.

For more details on ScanLight Plus, see the review of Computer Concepts' Greyhawk Video Digitiser in RISC User 6:10.

## AIM version 2.10

AIM (Another Image Manager) is a pure image processor package for grey-scale images. It runs entirely on the desktop and presents four image windows and a command-line interpreter window. It only accepts images in its own proprietary file format, and images are limited in size to 256x256 pixels. That said, both ChangeFSI and Translator/Creator output AIM images. AIM's menu is a formidable beast, with in excess of a hundred processing commands in various levels. Many of the entries are largely meaningless to the user who has not spent some time studying the manual, and concern all kinds of filters and mathematical processes.

AIM is without doubt exceedingly interesting, and you could spend hours playing about with it.



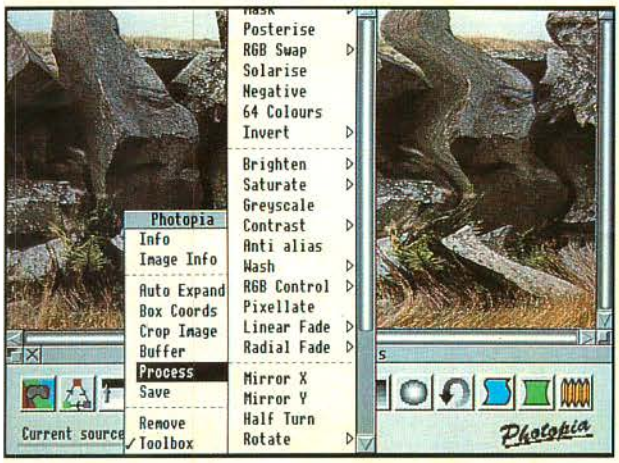

However, it's a deeply serious program, definitely not for the faint-hearted.

For more information about AIM, see the *Working with Images* article in RISC User 6:7.

## Photopia version 2.23

CIS' Photopia is purely an image processing package for 256-colour sprites. It provides two image banks, in a similar way to AIM's four, and lets you choose freely which is the source and which the destination. A toolbox window provides easy access to many functions, but the Process menu has all the functions in the toolbox and more, and so the toolbox seems a little redundant. Unfortunately the program operates quite slowly with anything other than small areas of an image.

However, the range of options it provides is quite extensive, with less emphasis on the mathematical and 'filter' type operations and greater emphasis on colour control and fancy effects. The majority of possible operations centre around manipulating the RGB colour components in various ways, performing posterising effects or distorting the image into fancy shapes (such as ellipses, pyramids or wobbles).



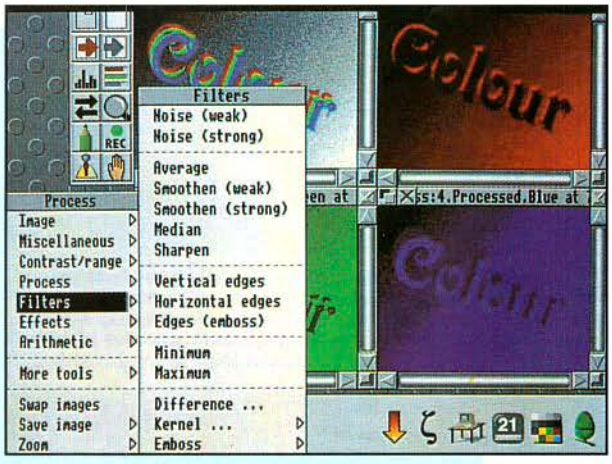

Photopia performs adequately but in the end is unremarkable. Whilst it could be of reasonable value to owners of a colour digitiser, it is more likely to be of use as an artist's resource.

## Process version 1.20

Henrik Pedersen's shareware package, Process, is a remarkable piece of software. It is an extremely capable image processor with some painting facilities thrown in.

There is always a source and destination buffer, and you can configure up to seven additional buffers. A handy toolbox provides easy access to many functions, and the extensive menu contains a very large range of all kinds of image processing options, all of which work commendably quickly on either the full image or a selected area. Many of the processing options make use of a colour picker window which is the most flexible and interesting I have ever seen. In addition to the standard 256 colours, you can display an interactive slice of the RGB colour cube for a fixed value of either red, green or blue. The colour picker also works in CMYK, as well in as RGB mode. The program will also create RGB, CMYK and HSV separations.

A comprehensive selection of filters is complemented by a user-definable one, which is made even more flexible due to the fact that you can load definitions in the form of text files. You can also create macros by using a kind of built-in tape recorder to record operations, and Process also provides a reasonably comprehensive range of painting tools, although its painting facilities are second to its processing ones.

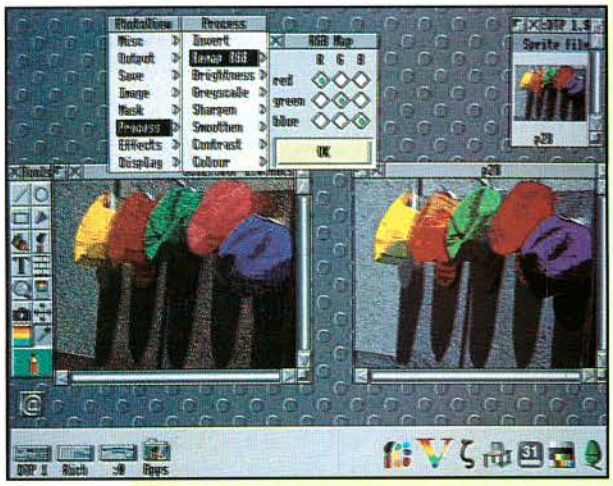



The facilities currently provided by Process are tremendously flexible, but the author is already working on a new version which will work with true-colour sprites and 24-bit images, and provide independent control of the red, green and blue components of an image, and numerous other features.

Process was examined in detail in RISC User 6:9.

| Application | ChangeFSI | Translator | GreyEdit | ScanLight Plus | AIM |
|---|---|---|---|---|---|
| Feature | 1 | 2 | 2a | 3 | 4 |
| Processing area | Whole image | Whole image | Whole image | Whole image | Whole image |
| Colour/Greyscale | Colour | Colour | Greyscale | Greyscale | Greyscale |
| Scaling options | Many | Many | N | N | N |
| Rotation | ±90° | 90° steps | N | 1° steps | Y |
| Flip images | Y | Y | N | Y | Y |
| Wobble/Sphere/Fancy effects | N | N | N | N | N |
| Fancy fills | N | N | N | N | N |
| Mode conversion | Y | Y | N | N | N |
| Can create new images? | N | N | Y | N | N |
| Expand/reduce range | Y | Y | Y | N | Y |
| Histogram operations | Y | N | Y | N | Y |
| Floyd Steinberg diffusion | Y | Y | N | N | N |
| Noise removal filters | N | N | Y | Y | Y |
| Invert image | Y | Y | Y | Y | Y |
| Greyscale/Mono conversion | Y | Y | N/A | Auto | Y |
| Posterise/Threshold ops | N | N | N | N | Y |
| Smoothing/Blurring filters | N | N | Y | Y | Y |
| Sharpening/Edge filters | Y | N | Y | Y | Y |
| Transition manipulation | N | N | N | Y | Y |
| Brightness/contrast | Y | N | N | Y | Y |
| '3D contour' effects | N | N | Y | Y | Y |
| Arithmetical operations | N | N | N | N | Y |
| Gamma/Black correction | Y | Y | N | N | N |
| RGB weighting | Y | Y | Grey enhance | Greymap edit | N |
| Supplier | Acorn | PD | PD | Comp Concepts | PD |
| Telephone | 0223 254254 | P D Libraries | P D Libraries | 0442 63933 | P D Libraries |
| Price | Free | £10 | See Translator | With hardware | Register £25 |

**Table notes With the huge variety of features provided by these packages it is almost impossible to make a fair representation of features in a table such as this. All it can hope to do is to indicate the kinds of facilities that are available.**



## PhotoView version 1.10 (Development)

PhotoView from Klein Computer is unfortunately a long way from being complete at the time of writing. The version I received is developmental, and none of its image processing functions actually do anything! However, from the contents of the menus and windows, and from the bits that do work, PhotoView appears to be quite promising.

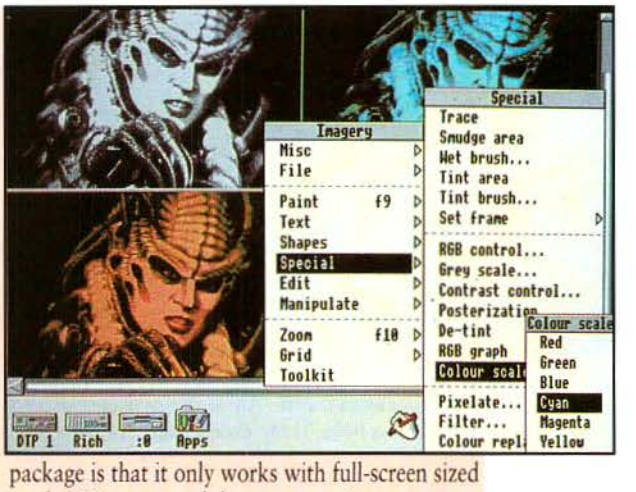
It is obviously going to be a combined image processing, painting and file conversion package, capable of loading and saving in a variety of image formats. Processing effects include options for colour mapping, inversion, grey- or colour-scale conversion, brightness and contrast control, and smooth and sharpen filters. As for special effects, only 'pixelate' and 'posterise' are currently listed. Clearly a program to watch out for.

| Photopia | Process | PhotoView | Imagery | ImagePro | ProArtisan 2 |
|---|---|---|---|---|---|
| 5 | 6 | 7 | 8 | 9 | 10 |
| Rectangles | Rectangles | ? | Rectangles | Freehand | Arbitrary |
| Colour | Colour | Colour | Colour | Colour | Colour |
| | | | | | |
| N | N | Y | Selections | Selections | Selections |
| 1° steps | 1° steps | 1° steps | Selections | Selections | Selections |
| Y | Y | Y | Selections | Selections | Selections |
| Y | Y | N | Y | N | Y |
| Y | Y | Y | Y | Y | Y |
| N | N | ? | N | N | Y |
| N | Y | Y | Y | Y | Y |
| | | | | | |
| N | Y | Y | N | N | N |
| N | Y | N | N | N | N |
| N | N | Y | N | N | N |
| | | | | | |
| N | Y | N | N | N | Y |
| Y | Y | Y | N | Y | Y |
| Y | Y | Y | Y | Y | Y |
| Y | Y | Y | Y | Y | Y |
| N | Y | Y | N | Y | Y |
| N | Y | Y | Y | Y | Y |
| N | Y | N | N | N | Y |
| Y | Y | Y | Y | Y | Y |
| Y | Y | N | N | N | Y |
| N | Y | N | N | N | N |
| N | Y | N | N | Y | N |
| Y | Y | ? | Y | Y | Y |
| | | | | | |
| CIS | PD | Klein Computer | Palette Studio | Longman | Clares |
| 071 278 5136 | P D Libraries | 010 49 614 281 131 | 0733 344245 | 0223 425558 | 060648511 |
| £25? | £10 | £60 | £70 | £125 | £135 |

## Imagery version 2.11

Imagery from Palette Studio is a combined painting and image processing package. It has a reasonably full range of painting tools, along with various kinds of fill options and the ability to 'mask' particular colours so they are not affected by subsequent operations. Imagery offers quite a few options for manipulating sprites in terms of rotation, scaling and fancy effects. It has a particularly powerful 'Wobble' tool which can distort a picture along any trigonometric function you care to supply, and which is a good deal more powerful than similar options in other programs, though much less easy to use.

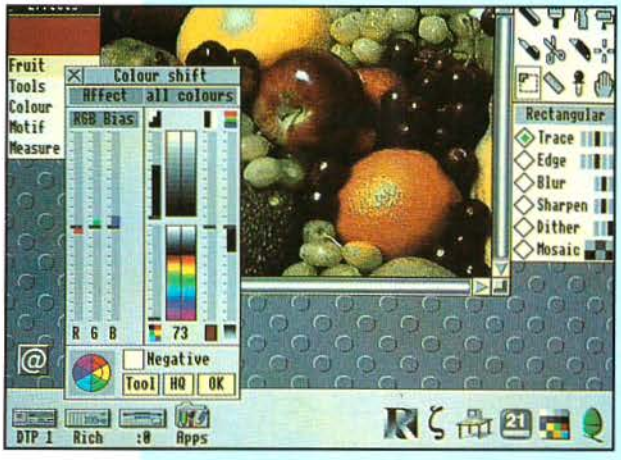
As for image processing options, most of the fourteen options provided are for colour control, such as RGB components, colour and grey scaling and tinting areas. Although they work quickly enough, a really comprehensive range of effects is not provided. The biggest limitation of the package is that it only works with full-screen sized mode 15 images, and does not even import standard sprites particularly easily. On the whole, it is quite difficult to recommend this package.




A full review of Imagery can be found in RISC User 6:3.

## Revelation ImagePro v 3.47

ImagePro is the latest, most powerful instalment of Longman Logotron's highly popular Revelation series. It is primarily a painting package, but also contains several image processing options and, particularly, some impressive colour control options. There are six classes of effect available (Trace, Edge, Blur, Sharpen, Dither, Mosaic), as well as a variety of Blend options, with each effect having a range of settings. Uniquely, all of these effects can be applied to areas which have been drawn freehand, as well as to rectangular areas.




All the functions are quick and easy to use and, as a painting package, ImagePro is very comprehensive. However, its colour control options are where it really shines, and these capabilities are second to none. Contrast control, colour translation and separation, posterisation and many other effects are available from a single (slightly confusing) window, and again the options are easy to use once you know what you're doing.

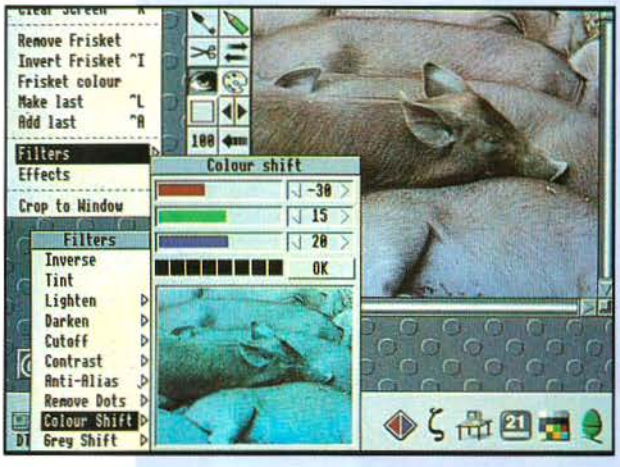
Although its image processing facilities are relatively few, as an art package ImagePro is very flexible and powerful.

For a full review of Revelation ImagePro, see RISC User 6:4.

The closest package to ProArtisan 2 is Revelation ImagePro. Both are powerful, though ProArtisan is definitely the better image processor of the two, even though ImagePro has the better colour control options.

## ProArtisan 2 version 1.01

Released very recently, ProArtisan 2 is a combined painting and image processing package with a fairly equal emphasis on both areas. Whilst most image processors operate on either the full image or a selected rectangle, ProArtisan 2 is unique in offering the extremely powerful frisket option. Without going into great detail, this means that you can define an area of any arbitrary shape (or maybe several simultaneously) as a 'frisket', and have the processing options operate on everything except the frisket. Only Revelation ImagePro, with its freehand option, approaches the power of this facility. However, if you want to process a selected rectangle in ProArtisan 2, you do have to define it as a frisket first, which is a bit long-winded.




As an art package, ProArtisan 2 is very powerful indeed; as an image processor, it also excels. It has a very wide range of processing effects available, such as colour and greyscale control, anti-aliasing, noise removal, halftoning, addition of textures, and the ability to wrap images around a sphere. Like the shareware Process package, it also has a user-definable filter (with a range of presets) which you can use to create your own effects. Twenty one general effects and filters are built in, with an additional fifteen presets in the user-definable filter window.

**Conclusions** All of the packages under scrutiny here have features to recommend them, but two stand out as being really exceptional: Process and ProArtisan 2. Both can deal with images of all shapes and sizes, and have both painting and processing facilities, although Process is the more powerful image processor of the two, whilst ProArtisan is the better painting package. Process really does contain a tremendous range of options, and of all the packages here it is the only one even to aspire towards the kind of facilities you might find on other computer systems. It doesn't approach the power of something like PhotoShop on the Mac, but nevertheless the potential is there. A 24-bit version is under development, and once Acorn's high-end machines arrive, who knows?

# Desktop C - Displaying Sprites

*David Spencer kicks off a new series on C programming*

Welcome to this new series. Unlike the previous series on C programming and writing Desktop applications, Desktop C will adopt much less of a tutorial style. Instead, we shall be looking at the programming tasks required in writing real Desktop applications, and showing how these tasks are performed. To start off with, we are going to look at what is involved in displaying sprites in a window, and particularly how to redraw them properly. At first sight this would seem a simple enough task, but as will be revealed, a bit of thought and careful programming is needed. Throughout the series we will present fragments of code that can be incorporated into your programs, and in each case, a complete example program will be given on the magazine disc.

## DOWN TO WORK

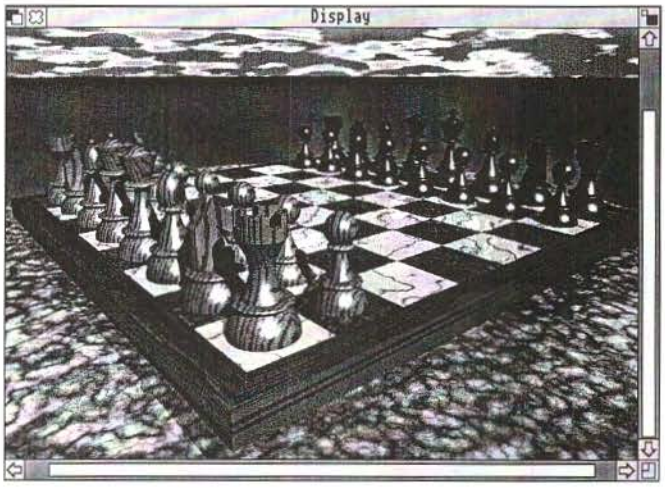
To make things simpler, we will assume that we are displaying a window containing just a single sprite, and the window has been created to be just the right size. We will also assume that a sprite area containing just our sprite has already been created, most probably as a flex block. The functions declared in RISC_OSLib's sprite.h allow a sprite area to be created, a sprite loaded and the size of a sprite found.

There are three factors that we must consider in displaying our sprite:

1. Drawing it in the right place
2. Drawing it at the right size
3. Drawing it in the right colours

Points 2 and 3 are important because the application must be mode independent, and therefore the sprite must be plotted correctly regardless of the current screen mode.

Listing 1 gives our basic sprite redraw function. This takes as its arguments a pointer to the sprite area containing the sprite, a Wimp redraw structure, and a pair of scale factors. The redraw structure is as returned by a redraw poll request, and therefore this function can be called directly from the window's redraw loop by passing it the redraw structure and the appropriate pointer to a sprite area, and a pair of scale factors. The scale factors allow the sprite to be zoomed up or down, and are specified in terms of a multiplier and a divider. Remember that if you change the scale factors, you must also change the work area extent of the window to match the new size, otherwise only part of the sprite will be visible.




**A sprite in a window using the routines described here**

Going through the function line by line, the first task after declaring a bunch of automatic variables is to call *wimpt_checkmode()*. The reason for this is that later a call is made to the function *bbc_modevar()*, and it is vital to force RISC_OSLib to update its cached information about the current mode. Failing to make this seemingly innocent call can lead to no end of problems that are hard to track down in a complex program.

Next, a sprite id block, *id*, is set up to identify the sprite. *id.tag* is set to the magic number 0x74527053 (the letters SpRt) to show that we are specifying a pointer to the sprite, and not its name. *id.s.addr* is then set to the address of the sprite which is simply the pointer to the sprite area plus the offset to the first sprite. Having set up the sprite id block, a call is made to *sprite_readsize()* to read the size and screen mode of the sprite.

The functions declared in *coords.h* are used to translate the Wimp's redraw box into the co-ordinates for plotting the sprite (in *origin_x and origin_y*). There is a complication here in that the origin of the window's work area is at the top left-hand corner, but to plot a sprite you must specify the bottom left-hand corner. This is allowed for by the additional calculation in *origin_y* which subtracts the depth of the sprite in OS units from the y co-ordinate of the window origin. The depth is calculated as taking the sprite's height in pixels, converting it to OS units (using *Modevar_Yeig* read with *bbc_modevar()*) and scaling by the zoom factor.

```
static void redraw_sprite(sprite_ptr *sarea, wimp_redrawstr
*r, int scale_up, int scale_down)
{
  int origin_x, origin_y;
  sprite_pixtrans translate[256];
  sprite_factors scale;
  sprite_id id;
  sprite_pixtrans *transptr;
  sprite_info info;

  wimpt_checkmode();

  id.tag = 0x74527053;
  id.s.addr = (sprite_ptr)((int)sarea + sarea->sproff);

  if (sprite_readsize(sprite, &id, &info) != NULL)
    return;

  origin_x = coords_x_toscreen(0, (coords_cvtstr *)&r
->box);
  origin_y = coords_y_toscreen(0, (coords_cvtstr *)&r
->box) - ((info.height << bbc_modevar (info.mode,
Modevar_Yeig)) * scale_up / scale_down);

  if (wimp_readpixtrans(sarea, &id, &scale, translate) !=
      NULL)
    return;

  if (!(wimpt_bpp() == 8 && bbc_modevar(info.mode,
       Modevar_Log2BPP) == 3 && (((sprite_header *)
       id.s.addr)->image - sizeof(sprite_header)) / 8
       != 256))
       {
         if (translate_sprite_colours(id.s.addr,
             translate))
           return;
         transptr=translate;
       }
     else
       transptr = NULL;

  if (scale_up != scale_down)
    {
      scale.xmag *= scale_up;
      scale.ymag *= scale_up;
      scale.xdiv *= scale_down;
      scale.ydiv *= scale_down;
    }

  sprite_put_scaled(sarea, &id, 0, origin_x,
                    origin_y, &scale, transptr);
```

The next stage uses *wimp_readpixtrans()* to read the scaling factors needed to plot the sprite in the current screen mode. These are returned in the *array* scale, which is defined on entry to the function. This call also reads the Wimp's colour mapping for the current mode, but this is of no use here. However, we have to provide somewhere for the mapping to go, so we use the 256-byte array *translate* which is used again later.

Now the tricky bit - the colour translation. The principle is quite simple: a translation table of up to 256 entries must be created to map the colour numbers from the sprite onto real colour numbers that can be plotted. This mapping depends on the relationship between the mode of the sprite, the current screen mode and the sprite's palette. All this translation is done using the calls provided by the ColourTrans module. However, these calls are slow and we have to ensure that only the bare minimum of processing is performed.

The first line of this section performs the test: "Is this a 256-colour sprite in a 256-colour mode that doesn't have a 256-colour palette". If the answer to this question is 'yes', then no translation is needed because both the sprite and the screen mode will use the same palettes. In this case, the

translation pointer, *transptr*, which is used later is set to zero to indicate no translation. The check for the sprite not having a 256-entry palette is needed because 256-grey scale sprites (which do have a 256-entry palette) need special handling which we will look at in a minute. Having decided that translation is needed, a separate function, *translate_sprite_colours()*, is called to set up the mapping.

The function starts off by setting the variable *ptr* to point to the palette data for the sprite, and then copies the palette entries into a separate array, assuming that there is a palette. If the sprite has no palette, which is indicated by the sprite data immediately following its header, the data is obviously not copied. Note that within the copying loop, ptr is incremented twice. This is because each palette entry is repeated (a legacy of the days of flashing colours).

Having copied out the data, the ColourTrans module is used to create the translation table from the sprite's palette and mode to the current palette and mode. For most cases, this is done by a single call to *colourtran_select_table()*, but for 256-grey scale sprites (identified because they have 256 palette entries), the entries have to be translated one-by-one using calls to *colourtran_return_colournumber()*. In either case, the translation table is written into the array passed to the function. Under RISC OS 3, this translation can be simplified, because ColourTrans has been extended, both to read a sprite's palette directly, and to cope automatically with 256-grey scale sprites. The simplified version is included on this month's disc.

```
}

/* Use ColourTrans to get mapping for sprite */
static os_error *translate_sprite_colours
       (sprite_header *addr, sprite_pixtrans *translate)
{
  wimp_paletteword sprite_palette[256];
  int mode = addr->mode;
  wimp_paletteword *ptr = (wimp_paletteword *)
                    ((int)addr + sizeof(sprite_header));
  int count, entries, colour;
  wimp_paletteword *palette_ptr;

  if (addr->image == sizeof(sprite_header))
    palette_ptr = 0;
  else
    {
      entries = (addr->image - sizeof(sprite_header)) / 8;

      for (count = 0; count < entries; count++)
        {
          sprite_palette[count] = *(ptr++);
          ptr++;
        }
      palette_ptr = sprite_palette;
    }

  if (entries == 256)
    {
      for (count = 0; count < 256; count++)
         {
           colourtran_return_colournumber
           (sprite_palette[count], &colour);
           *(translate + count) = (sprite_pixtrans)colour;
         }
      return NULL;
    }
  else
    return (colourtran_select_table(addr->mode,
            palette_ptr, -1, (wimp_paletteword *)-1,
            translate));
}
```

Finally, before plotting the sprite, the scale factors in *scale* are adjusted to take into account the zoom factors specified in the function call. The sprite is then plotted by a simple call to *sprite_put_scaled()*, using the values calculated earlier in the function. The third parameter is set to zero to specify the GCOL plotting mode which in this case plots the sprite directly without taking into account what's already there, and without allowing for a transparency mask.

## POINTS TO NOTE

There are a few points that it is worth noting about this code. Firstly, prime consideration is given to speed. In particular, as already said, only the minimum amount of colour

translation is performed as this is a very time consuming process. With any redraw code speed is absolutely vital to prevent a sluggish Desktop.

Secondly, there are quite a large number of casts in the code. For example, in the calculation of *id.s.addr*, the sprite area pointer is cast to an integer, added to another integer and then cast back to the type *sprite_ptr* needed by *id.s.addr*. There's no way around using casts like this, but you must exercise care as by nature of what they do, a cast forces the compiler to abandon most of its type checking. Even simple mistakes in the code could lead to totally inappropriate data being passed to calls without the compiler batting an eyelid.

Finally, wherever an error is returned from a library call, the function exits immediately without reporting it. This is important in redraw code because if an error box appears over the window being redrawn, when it is cleared a further redraw attempt will be made with the generation of the same error again. This leads to the infuriating situation of a persistent error box that you can't get rid of.

## GOING FURTHER

The example given here does have practical applications - it is based on the scanned image viewer in the RISC Developments' *Spectra* scanner application. However, in most cases the sprite will be only a part of the window contents being redrawn. In this case, the function needs to be modified to calculate the correct co-ordinates based on the position of the sprite within the window's work area. To speed things up, the redraw code can calculate whether the sprite is actually within the area being redrawn, and only call our function if it is actually needed.

*This month's magazine disc incorporates the functions given here into a simple program that loads and displays a sprite. In next month's Desktop C we will look at the operations involved in loading and displaying Draw files.*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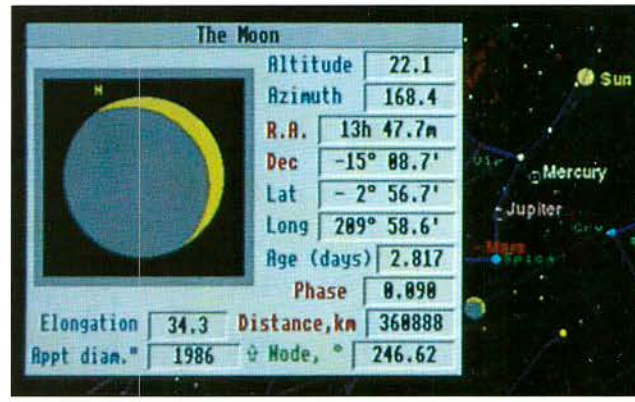
# A Telescope on your Screen

*Ken Cowap reviews NightSky - the all-purpose Starmapper, Planetarium, and Telescope Simulator from Clares.*

NightSky is an application for generating star maps to any scale from a viewpoint anywhere on Earth. It is supported by a very well written 120 page manual, showing a strong educational slant, with plenty of illustrations and a good index.

A review of any software package should include comparisons with like packages. This is difficult in the case of NightSky because it's one of the very few 'serious' sky mappers for Acorn's 32-bit machines. Readers might like to read the review of SpaceTech's Orrery in RISC User 5:8 - a comparable package but using a different approach. However, for comparison purposes, I'll select a few features of *The Sky*, a PC package from Software Bisque in the U.S.A. It seems to be regarded as 'one of the bigger and better' on the market. See the September 1993 issue of Astronomy Now for reviews of PC astro software. Most PC Astronomy packages require huge amounts of number crunching power, and hence are unusably slow if run under the PC emulator on the Arc.

*The Sky* is something of a heavyweight, costing about twice as much as NightSky, even in its lowest Level 1 form with a catalogue of only 10,000 stars. Upgrade catalogues bring the total to 45,000 or 272,000. Having seen NightSky in operation with its 26,104 stars, I feel that's more than enough for the keen amateur.




**Instant lunar data from the Map menu**

**Neptune and Uranus near the Milky Way**

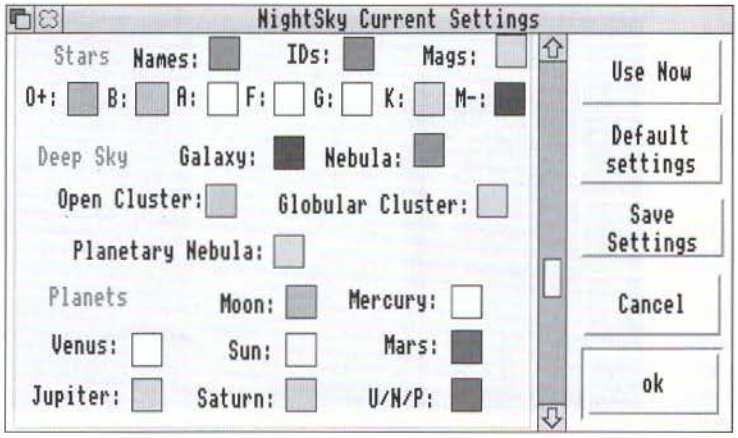
*The Sky* needs 11.5Mb of disc space, or 13.5Mb for the Windows version - owners of earlier Acorn machines draw in their breath sharply! Compare this with NightSky's thrifty 987Kb. RAM needs vary from just squeezing into a 1Mb machine, to 1568Kb for a fairly full configuration; 2Mb or 4Mb machines are strongly recommended. As you'd expect, *The Sky* provides several more powerful facilities, including a full orrery, direct drive for a suitably fitted telescope, a picture gallery, instant screen scrolling and a conjunction finder. Generally speaking, it will do anything NightSky does, though not always as well. Of course, not everyone, funding aside, would regard telescope drive from a desktop computer, or even a laptop, as a practical setup.

IN USE

NightSky's default start-up display shows the 'whole sky', horizon to horizon in all directions,

represented by a circle containing, initially, a limited number of stars. However, any selection of stars, under comprehensive user control, may be displayed.

The NightSky application comes on two discs: the Program disc, which also contains the Zodiacal and Small Object catalogues, and the Resources disc, which contains the remaining bulk of the Object catalogue. Users of 1Mb or 2Mb machines may readily tailor the number of objects used, by selecting the minimum star magnitude to be displayed.




**A few of the 111 Options for Map Configuration**

All regular modes are supported. Where memory permits, 256 colour modes show NightSky to its best advantage. My own favourite is mode 28. The Sun, Moon, planets and deep-sky objects are included, together with very comprehensive facilities for finding and describing in detail the object's characteristics and location, starting either from a point indicated on the current map, or from its name or catalogue number. Objects and map details are identified using a range of 31 colours, all user-allocated for optimum readability. Any object may be tagged with a short descriptive file that can subsequently be read, edited or deleted. A few hundred objects are already tagged.

NightSky contains zoom facilities that range from the hemispherical 180 degrees down to a miniscule 1/8th of a degree, behaving as a software telescope. In this respect it outstrips *The Sky*, which only manages one third of a degree. NightSky's map orientation is easier to follow than that of *The Sky*, being always parallel to the horizon with a north arrow shown. There are two zoom methods: the first involves dragging a rectangle to enclose the required map area, the second allows you to enter Field and Azimuth values.

At high magnifications, the phases of the planets, Saturn's rings, and the satellites of Jupiter, are shown to correct scale, and a suitably chosen real-time interval can illustrate the colour-coded satellites' motion.

The display may be updated in real-time, forwards or backwards, at user-specified intervals, or set to a fixed time in the future or past within a range of 10,000 years. This allows long term changes in the sky, such as the precession of the equinoxes and proper motion of the stars, to be shown. On a shorter time scale, solar and lunar eclipses, lunar occultations, and predictions of these, may be studied and recorded. An optional Lock facility, like the electronic drive on a real telescope, prevents the loss of a chosen object due to the Earth's rotation. Thirty eight demos show a selection of animations of prominent events already seen, and some forecasts, including the long awaited 1999 total solar eclipse which should be visible from parts of Cornwall.

All displays or animations can be saved as Draw or Sprite files, or, far less memory intensive, as CSV files, which allow NightSky to quickly re-create the map. Sequences of linked maps may be generated and saved, to be run later as a *movie* illustrating events such as occultations.

NightSky can be extensively customised, not only to determine its start-up presentation, but subsequently under the control of Configuration files, Map Instruction files, and Files of Places, thus offering on-the-fly alternative presentations. Its !Run file may be amended so that the appropriate customisation is included automatically. The keywords of this application are flexibility with accuracy; nevertheless it starts without any fuss in its default mode to give stunning displays, and it's up to the user to decide just how much customisation suits his needs.

The numeric accuracy, understood to be to 64 bits using a special method, may be judged from NightSky's capability to calculate and display mutual planetary occultations - very rare events; some past examples are to be seen in the Demos

file provided. To achieve this degree of precision, NightSky's Precession option should be called, and the target precession year should be input as a decimal fraction, e.g. 1933.7436. This option can be made automatic for the integer year number by including it in a Choices file; such files may be dragged to the icon bar icon at start-up, and include information on the user's selected operating mode when this differs from the choices set by the !Run file.

NightSky provides the user with direct control over features such as:

- The mapping of constellation join-up boundary lines
- Colours of lines and anything else on the map
- Co-ordinate grid for either Altitude or Declination
- Classes of objects displayed or named
- Fonts used for name display
- Whether the Milky Way is displayed
- Limiting star magnitude

and numerous other details. There is very little indeed which isn't under selective user control.

NightSky has set a standard which competitors will find hard to surpass. If you've got an Arc and even the smallest interest in the sky, buy this application; it's guaranteed to get you bitten by the astronomy bug! I have no real criticisms as such. A few 'rough edges' still exist in version 1.00. None are too serious, and need just a little acquired expertise to negotiate. Beginners may take a little getting used to the change of orientation when a Zoom area is selected (always parallel to the horizon). Although Deep Sky objects (outside our own galaxy) are colour coded, a useful feature would allow each class, as well as stars and planets, to be toggled on or off any map separately. And it's a pity that RISC OS can't allocate more than 480K screen memory; this precludes a flicker-free animation display for the more suitable modes such as 28. Not NightSky's fault! Acorn please note.

**PRODUCT INFO**

| | |
|---|---|
| *Product* | *NightSky* |
| *Supplier* | *Clares Micro Supplies*<br>*98 Middlewich Road,*<br>*Northwich,*<br>*Cheshire CW9 7DA.*<br>*Tel. 0606 48511*<br>*Fax 0606 48512* |
| *Price* | *£68.04 ex. VAT*<br>*£79.95 inc. VAT* |

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# The RISC User Morpher

*By Colin Cassidy*

*This article is supported by a full morphing application, a demonstration and several Sprite files ready for morphing on your own system. For reasons of space, they can only be supplied on the monthly magazine disc (a two-disc set for this issue).*

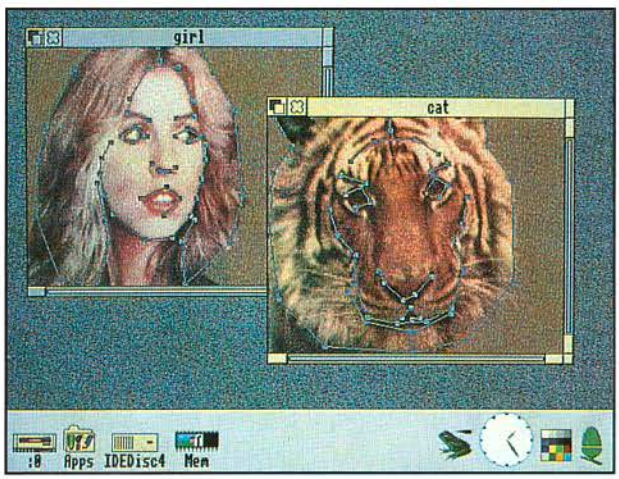



**Figure 1. Making the control points and lines**

Anybody who has seen *Terminator 2* will have been impressed by the stunning computer-generated special effects. Perhaps the most memorable is the ability of the liquid metal android to change into any character or object with which he comes into contact - a process which in computer terms is called morphing. To morph complex 3 dimensional shapes with cinema quality graphics requires an awesome amount of computer power, especially if they have to look metallic and therefore reflect their surroundings. A simpler type of morphing takes a 2 dimensional image and distorts it until it looks like something else. One television advert, for example, shows a snail metamorphosing into a frog!

Morphing works by matching up the common features of two images, such as the eyes and ears on a human face and a lion's face. The computer can then use this information to create the intermediate frames necessary for a smooth metamorphosis between the two pictures. The problem for the computer is knowing where the features are located in each image, and there it needs some help from the user. The following explanation describes the general principles involved with reference to the application *Morph* supplied on this month's magazine disc.

## MORPHING TWO IMAGES

When a suitable sprite file (see later) is loaded into Morph, the two sprites are displayed on the screen in separate windows. It is then necessary to mark a series of control points/lines over each sprite, indicating their common, linked features (see figure 1).

In practice, it is similar to using the straight line tool in Draw, except that any points or lines will appear in both windows. However, the points can later be moved independently in the usual way (by dragging with Adjust).

Once a set of control points has been placed over the sprites, Morph is ready to create an animation. To do this, use the Save Animation option from the main menu to designate a place for the animation to be stored (ideally on a hard disc). It is necessary to do this

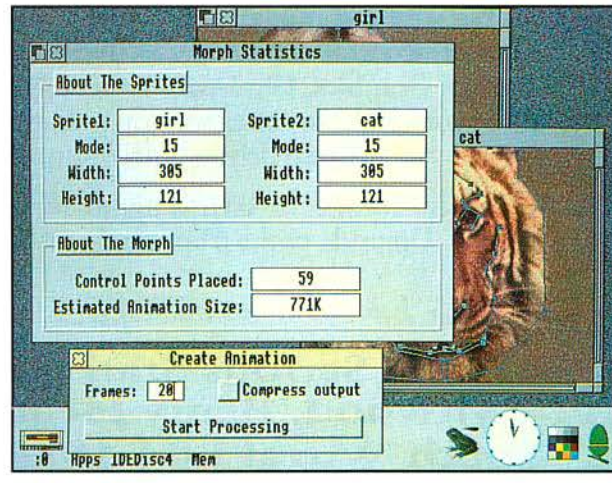



**Figure 2. The Statistics and Create windows**

before any processing takes place because, in an attempt to conserve memory, Morph saves each frame as soon as it has been created. This suggests a potential problem for any animation - a severe shortage of both memory and disc space.

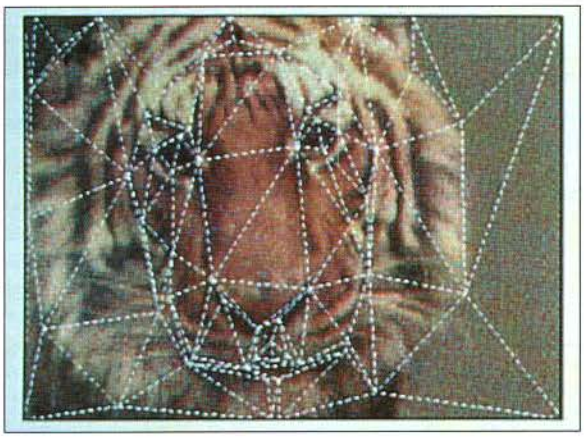


**Figure 3.**
**Enlargement showing arangement of triangles**

Next, open the *Statistics* and *Create Animation* windows, again from the main menu. The former gives (amongst other things - see figure 2) an estimation for the size of the completed animation, and the latter enables the length of the animation to be altered. Generally speaking, you should opt for as many frames as you are likely to be able to squeeze into memory or onto disc, but remember that a 1Mb computer may only have 600K to 700K of free memory in the Desktop. The *Create Animation* window also gives the option of using delta compression on the animation. Unfortunately, delta compression (which stores the differences between frames) does not work well with morphing, and so a compression of only 10% to 20% can be obtained. Against this, the extra processing required considerably slows the speed of the playback.

Once an animation has been created, it can be loaded (memory permitting) by double-clicking on its icon. The viewer window is multi-tasking but only really runs smoothly in the sprite's native screen mode. Alternatively, there is an option for a single-tasking display (which automatically selects the right mode). When single-tasking, the numeric keypad can be used to alter the playback speed: 9 is flat-out while 0 will stop the display altogether (which can then be single-stepped by pressing any other key). Pressing Space or any of the mouse buttons will return you to the Desktop.

## HOW IT WORKS

In order to stretch the images in a controllable way, Morph splits them up into a series of triangles. The vertices of these triangles are arranged to lie in the same positions as the control points, so that moving any point would distort the triangles around it. Figure 3 shows how the triangles might typically be arranged.

It is a relatively simple matter to calculate intermediate positions for the control points and therefore the triangles. The two images can then be mapped onto these triangles - fading gradually from one to the other. In practice, this technique moves to their new positions any features which can be matched up, while fading between the ones that cannot.

**Figure 4.**
**A further example showing the use of control points and lines**

## FINDING SUITABLE SPRITES

If you are lucky enough to own a video digitiser or a scanner of some sort, then you will be able to create your own sprites for morphing. Unfortunately, most people will have to look for suitable images from public domain or professional image libraries. But what constitutes a suitable image?

Generally Morph works most effectively with images which are similar but not identical, such as two faces or two cars. Furthermore, these images should be approximately the same

size and in the same orientation, otherwise the object might appear to grow or turn during the morph. Morph also expects its two sprites to be provided as a single file, to be the same size, and to be defined in the same mode (either a 16 or 256 colour mode). The 16 colour option, however, is only intended for sprites with a grey-scale palette.

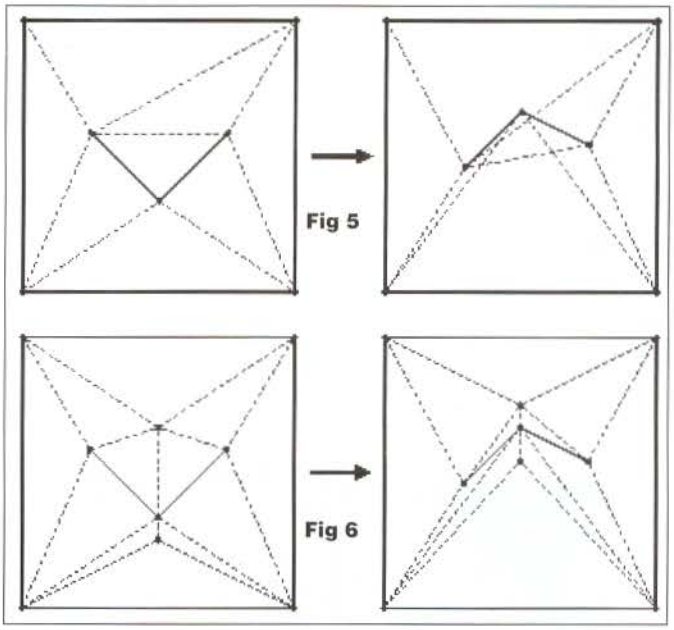



**Figure 5. Problems of inverting a 'V'**

**Figure 6. Inversion problems avoided**

It is actually quite unlikely that you will find two sprites which satisfy all of the above requirements, but it is usually possible to modify them using a combination of Paint and ChangeFSI (supplied on the RISC OS 3 support disc). You might like to proceed as follows:

Firstly, load the two sprites into Paint. You can then select which part of each sprite you are interested in either by using the *Delete Columns* and *Delete Rows* options (from the *Edit* submenu) or by using the *Copy Block* tool (the camera icon) with the *Export* option enabled. Once you have done this, amke a note of the size of the sprite. Paint can provide this information, or alternatively try to load the prospective file into Morph and then open the Statistics window.

The reason for finding out the size of each sprite is that there is an easy way to scale them using ChangeFSI - from the *Scaling* menu select the *Ignore Source Pixel Size* and *Custom* options, and then enter the scaling ratio in the following format:

New width : Old width
New height : Old height

If you wish to change the mode of the sprites at the same time, then this is fairly straightforward using the *Output* menu, but it is also possible to convert the sprites into grey-scale ones. Selecting the *Monochrome* option, however, will only give the sprite an 8 scale palette. For the full 16 shades, you must also tell ChangeFSI to create the new sprites in the 256 colour mode which is equivalent to the 16 colour one that you really want. For example, if you wanted a grey-scale mode 12 sprite, you would actually have to ask for it to be created in mode 15.

The sprites should now be ready to load into Morph, but it is worth checking them first using Paint. The reason for this is that, when scaling sprites, ChangeFSI sometimes gives them black edges. If this has happened then they can be removed by deleting the offending columns/rows (but remember to do the same to both sprites).

Lastly, if you have the time, then it is possible to use Paint to alter certain aspects of the sprites. The morph is more convincing, for example, if both images have plain backgrounds which are similar in colour. An effective way of doing this is to use the Copy Block option to replicate suitable parts of the sprite.

## GETTING THE BEST RESULTS

The most important factor determining the quality of any morph is the precise positioning of the control points. A little experimentation may be required with some arrangements, but there is a limitation which you should take into account. The problem occurs when trying to invert curves or other shapes. Figure 5 illustrates the simple example of a V-shape which is inverted during a morph. The dotted lines represent those added by the computer and as you can see, they become confused. In practice, the problem is not as bad as this diagram would suggest, and most minor cases will go unnoticed. However, with more complex images the aforementioned curves may fail to invert and there might even be a 'slicing' of the picture during the animation. Fortunately, this effect can be avoided by including control points either side of the offending line, as shown in figure 6.

Full instructions on how to use the Morph application, creating your own morphing animations, are included on the magazine disc.

# Introducing Photo-CD

*David Spencer investigates an exciting new development from the world's largest photographic company.*

The future, according to Kodak, is that in a few years from now we will have done away with conventional photographic prints, and instead we will be boring our friends with our holiday snaps on the family television. What has all this got to do with the Arc user you say? Well, the start of Kodak's future vision is the launch of Photo-CD - a method of storing high quality colour pictures on a CD-ROM which has direct relevance to computer users.

The idea behind Photo-CD is that you shoot your pictures in the normal way, and take the roll of 35mm film to the processors, just as for ordinary prints. The negatives are processed conventionally, but then instead of printing them onto paper, they are scanned with a high quality colour scanner into a powerful computer for processing. The result is an image set (described below) for each negative, which can then be recorded onto a writable CD-ROM - called a 'gold' in the trade. You then take the disc home and view the pictures at your leisure through a CD-ROM drive, or in the future a dedicated Photo-CD player.

Around one hundred negatives can be fitted onto one disc - in other words approximately four rolls of film. It isn't however necessary to have the disc filled in a single go. Instead, you just take your partially filled disc back at any time and have another roll added to it.

The cost of all this is probably less than you might expect. The blank disc costs around £5, and it costs about £10 per roll of film to process it and transfer the pictures onto the disc. It therefore works out at about fifty pence per photo overall. In practice, it is likely that people will still have their photos printed normally, and then choose just the best ones for storage on disc, as once stored a picture cannot be deleted.

## HOW IT WORKS

Photo-CD stores each picture as a set of images at different resolutions rather than as a single high resolution image. The reason for this is that the picture can potentially be displayed at a wide range of sizes, and if only a single size image was available it may have to be scaled up or down by a considerable amount. If an image is scaled up too much it becomes very pixellated and grainy, and it it is scaled down large amounts of information are lost. Loading an unnecessarily high resolution image would also waste time.

Photo-CD stores a base image of 768 x 512 pixels, which is mid-way between the resolutions of VGA (640 x 480) and SVGA (800 x 600) monitor displays. The aspect ratio of 3:2 differs from that of 4:3 used by television and most monitor displays, and more closely matches that of printed photographs. To this base image are added sub-images called Base/16, Base/4, 4xBase and 16xBase. The scale factor relates to the total number of pixels, giving resolutions for the sub-images of 192 x 128, 384 x 256, 1536 x 1024 and 3072 x 2048 respectively. Because these different resolutions are created from the original high-quality scan, they allow the final picture to be displayed satisfactorily in a wide range of resolutions by scaling from the closest sized image. The set of different images for a single picture is called an 'image pac'.

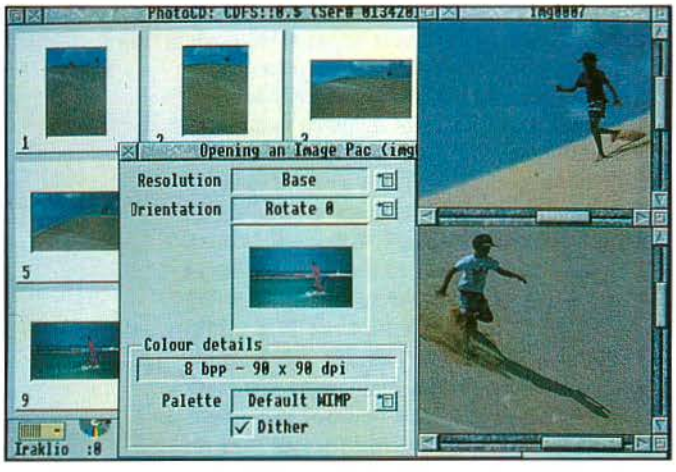
The individual images carry 24-bit colour information, giving a colour range in excess of that offered by broadcast television. The data is encoded and compressed using an encryption system called YCC. The Base, Base/4 and Base/16 images are stored directly, whilst the 4xBase and 16xBase images are stored in a highly compressed form that records their differences from the Base image. Despite the large amount of information carried, each picture only takes up at most six megabytes, giving the figure of one hundred pictures on a 600Mb CD-ROM.

## PHOTO-CD AND RISC OS

Photo-CD offers great potential for computer users, particularly in the field of multi-media. In a typical classroom environment a group doing project work could take photographs, have them converted into Photo-CD format and then incorporate them into a multi-media frame without the need for expensive scanning equipment. The idea is that Photo-CD is treated like a resource format, just like a sprite, a draw file, or a replay movie. It is expected that

eventually all RISC OS packages that can import still pictures, including DTP systems and multi-media packages, will be updated to handle Photo-CD images as well.

To achieve this aim, Acorn are developing the framework to use Photo-CD pictures in third party applications, just as ARMovie does for Replay. This support comes at a number of levels, some of which are available now, some of which are due for imminent release, and others of which are further off. The first requirement is the ability to recognise and access Photo-CDs. This is being added to CDFS which is the CD-ROM filing system code sub-licensed by Acorn to manufacturers of SCSI cards and CD-ROM systems. This new version of CDFS, version 2.2, will also offer a number of other enhancements, including speed improvements, and the ability to add device drivers for different models and interfaces of CD-ROM drives.




**Acorn's Photo-CD Viewer in action**

Stage two of the Photo-CD support is a front-end application that will display a contact sheet of all the images available on the disc, and allow individual images to be selected and exported as RISC OS sprites (rotating and mirroring them in the process). Any one of the sizes from an image pac can be selected, and converted to a sprite in 8, 16 or 24 bit formats, although the latter two are only relevant if you have a colour card fitted to your computer (not to mention the fact that a 24-bit version of the 16xBase image takes up 24Mbytes of memory). The time taken to load and convert a base size image is in the order of ten to fifteen seconds. Once converted to a sprite, the image can be used in any application accepting sprites. For example, it could be incorporated into a DTP page.

For more extensive image processing, Acorn have developed a new version of ChangeFSI which supports Photo-CD images. There is also a module providing SWI calls to allow applications to load Photo-CD images directly.

## WHAT YOU NEED

Obviously, to use Photo-CD you will need a CD-ROM drive connected to your computer. However, it is not quite as simple as this because it must be a particular species of drive. In particular, to support Photo-CD, a CD-ROM drive must be what is termed 'Multi Session'. The reasoning behind this is that as already said, unlike a normal CD-ROM title a Photo-CD can have extra data (pictures) added to it at any time, giving several sessions on the disc. Conventional CD-ROM drives are only able to access the first session - that is the first group of pictures written to the disc.

Most manufacturers now produce CD-ROM drives that support multi-session operation, and most of these are also double speed units, which means that they can read data at 300Kb per second instead of 150Kb. This is a positive boon when reading lengthy pictures.

To access Photo-CD discs, you will also need to upgrade to version 2.2 of CDFS, which should be available at the turn of the year from the supplier of your CD-ROM system. This upgrade, which will carry a nominal charge, will also contain the front-end displayer and sprite converter, and the new version of ChangeFSI.

## WHAT FUTURE ?

Remember Commodore CDTV. This was the first excursion of CD-ROM technology into the domestic market and was launched a couple of Christmases ago amongst great hype. Its demise a few months later didn't receive quite as much hype! CDTV was closely followed by Philips CDI - a similar system, which although still around hasn't exactly taken the marketplace by storm. My guess is that Photo-CD in the home is likely to go in exactly the same way, simply because people aren't ready for this type of technology yet. However, the ability to use Photo-CD as a high-quality, low-cost, scanning system for, in particular, multi-media applications ensures that it does have a future, and may well become the de-facto standard for storage of photographs.

# Rhapsody 3

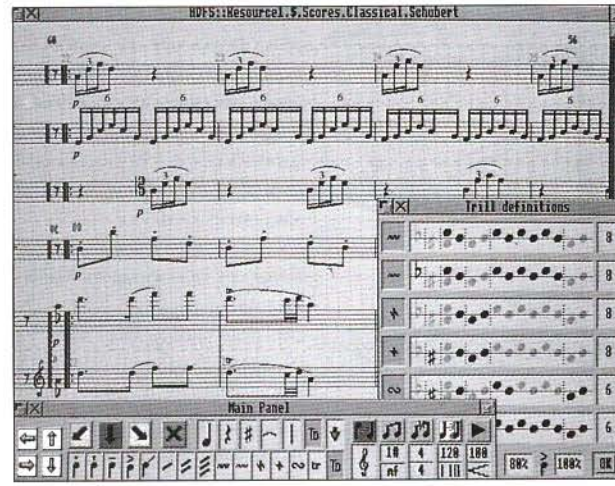
*What's the score?*
*Richard Hallas finds out.*

Version 3 of the popular Rhapsody music editor has just been released as part of Clares' continuing series of music packages. For those not in the know, Rhapsody is primarily a program for playing music on the computer (and via MIDI if available), but it has additional printout capabilities. This new version boasts a much improved user interface, a greater variety of musical symbols and better musical presentation.

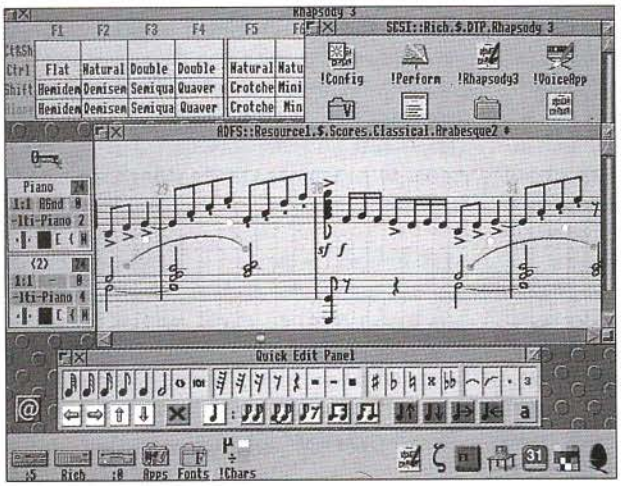
## THE PACKAGE

Rhapsody 3 comprises four discs and a manual, packaged in Clares' new style of thin cardboard box surrounded by a full-colour paper sleeve. Destruction by the Post Office is almost guaranteed: my copy arrived at just half its original width. Clares still haven't got it right, but at least the manual is now separate from the packaging.

The manual, although a little condescending in places, is generally well-written and clearly laid out. At 114 pages it's a fair size, but reading it is essential, as there are many features of the program which are not obvious at first sight. The discs contain the main program and a number of supplementary utilities, some voices and a large number of demonstration scores covering a wide variety of styles from early to popular music.




**Rhapsody's main panel and score windows**




**Editing a score with the QuickEdit panel**

## IN USE

Up to five scores can be loaded simultaneously, and in addition to the score windows, there is a fairly large *panel* window for note entry. Previous versions of Rhapsody were criticised for their cumbersome methods of entry, but thankfully, Rhapsody 3 is vastly improved in this respect, and there are now several ways of entering music. The three big arrows in the main panel can still be used to insert symbols at the cursor position, or to its left and right, but in addition, you can drag on any of the symbols in the main panel, whereupon the pointer turns into a copy of the symbol. You can move around the score, clicking where you want the symbol to appear. It is extremely helpful that there is a very large range of keyboard shortcuts which duplicate virtually every feature of the toolboxes and menus. This means that when you are dragging notes around with the pointer, you can simply press a function key to change the note value, so you don't need to visit the panel again. If you make a mistake, you can drag notes and other symbols around the score.

Clicking on the main panel's toggle size icon turns the window into the *quick edit* panel, which is intended primarily for correcting mistakes. In fact, it can be used as quite a useful note entry system in its own right, but it lacks the full range of symbols available in the main panel.

## MIDI

In addition to these entry methods, Rhapsody can transcribe directly from a MIDI keyboard in step time, real time or semi-real time capture modes. These respective methods mean that you can enter notes one at a time, in actual rhythm, or by holding down the notes for appropriate lengths of time. Comprehensive quantisation options are available for tidying up what you have played.

Being an intentionally MIDI-orientated package, Rhapsody can deal with a large number of staves simultaneously, with the maximum number being configured using a separate program. The computer's internal sound system can only cope with eight simultaneous channels, but Rhapsody lets you determine how many (if any) computer channels are allocated to each stave. Various options can be applied to each stave, such as which sound it uses, its stereo position and whether or not it transposes, and you can now turn on a separate window to the left of the main score which shows an abbreviated, editable summary of most of this information. Given that Rhapsody can cope with many staves, it is useful that the display can be switched between five different sizes, although the small ones can be difficult to use when editing. A proper zoom facility might have been nice. Despite having a lot of window redrawing to do whilst playing, the flow of music was never disrupted during my tests. Due to the complexity of the program, though, music will only scroll in pages. Tempo, dynamic, key and voices changes are all possible, guitar chords can be inserted, and Rhapsody will play all accents and ornaments correctly, as well as letting you define them.

## EMBELLISHMENTS

Rhapsody 3 now has far more musical symbols than it ever used to have, and these include - at last - proper phrase marks and hairpins - crescendo and diminuendo marks. All the most common musical symbols are in there, and as well as these various musical adornments, you can also enter as much text as you want, in the form of musical directives, expression markings or underlay (lyrics). Text may be entered in a choice of five definable fonts. Helpfully, when text entry is on, you can call up a menu of common musical terms, and these will be entered for you at a click of the mouse. However, since text has to be entered into 'slots' that can only contain 11 characters, to enter anything longer you have to do a lot of jiggling of slot widths, which is not very satisfactory. Also, you can't edit entered text: you have to delete and then type it again.

The *Score* window looks similar to previous incarnations, and still contains the same little box cursor for note entry. However, the most striking difference initially when you load a demonstration score is the bewildering mesh of faint dashed lines. Once you understand what these are for, they are actually very helpful, but you can turn them off if you don't like them. Rhapsody thinks of everything in terms of 'slots', and every slot is surrounded by dashed lines on all sides. Each slot contains a musical 'event' (a note, rest, barline, etc.), and the visibility of the slots provides quite a useful aid both in terms of note entry and in that it allows you to see more clearly just how the spacing works between staves, so you can modify the default layout if it is unsatisfactory.

Marking blocks in the score is much easier now, as you can just double-click at one corner of the block you want to mark, and drag to the diagonally opposite corner. Many operations can be performed on marked blocks, such as copying, deleting, transposing, adding or removing accents, and various kinds of tidying up.

## PRINTING

Choosing *Format* from the menu leads to a window which allows you to select portrait or landscape printing, print scale as a percentage (although there is only a range of presets - you can't actually type in a specific percentage), size of margins and which staves to print. Having made your choices, clicking on OK

opens up a preview window which lets you view how your score will print out. The *Format* window stays open at this stage, letting you alter your printing scale, etc.

In the *Preview* window, as in previous versions of the program, you can click Menu over a specific musical line and try to add or remove bars. The music can be packed to try to fit more on each line, or you can compress the horizontal printing scale (which reduces legibility). Both of these are global options, but you can pack specific areas of music when editing. Although beams, slurs and brackets are drawn, and outline fonts are used for text, most musical symbols (including notes and clefs) are simply sprites (the same as those used on-screen), and have quite a blocky appearance when printed on a good printer.

## CRITICISMS

Rhapsody performed very well, and apart from the one time it corrupted my score, I didn't find any significant bugs. Luckily I didn't lose much because of its handy auto-save feature. Although the program's colourful presentation is a bit gaudy for my taste, it is all sensibly laid out and easy to use. A silly omission is the fact that none of the keyboard shortcuts are listed in Rhapsody's menus. Given the large number of them (covering four pages of the manual), if would have been helpful if the menu shortcuts at least could have been shown.

It also seems a pity that hairpins placed in the music are only for show: to gradually increase or decrease the dynamics you still have to enter the amount of change you want over the required number of beats, which is rather unfriendly. It should have been possible to link this with the hairpin marks and automate the process.

A point that is well worth making is that the musical presentation is much superior to that of previous versions, and the program now makes a better job of sloping the beams correctly, avoiding colliding note-heads and the like. Of course, it's still far from perfect, and the more complex instances of chords with accidentals will catch it out, for example, but the situation has nevertheless been greatly improved since Rhapsody 2. Moreover, you can play about with the slot widths to improve the default layout.

The least satisfactory aspect of the program is undoubtedly printing. This is a shame, as I can see no good reason why Rhapsody 3 should not have been able to create its own Draw files. ScoreDraw was added after Rhapsody 2 was published, so its existence in that case was reasonable, but given that Rhapsody 3 is a new product, it seems to me that its inability to produce Draw files without an additional program is very much a missed opportunity. Surely it would have been better to charge a bit more for Rhapsody 3 with Draw file creating abilities than to force users to pay another £50 (or whatever it costs) for an additional program if they want a decent quality print-out.

## CONCLUSIONS

As a music-playing program on the Archimedes, Rhapsody 3 is second to none. Its capabilities have been considerably enhanced, and its user interface will now help rather than hinder you.

It is important to remember that Rhapsody 3 is not intended as a full music typesetting package. Even if you buy the new ScoreDraw, whilst you will get a reasonable quality Draw file, you will not get the flexibility and quality of output provided by a dedicated music typesetting program such as PMS or the new Sibelius.

**PRODUCT INFO**

| | |
|---|---|
| *Product* | *Rhapsody 3* |
| *Supplier* | *Clares Micro Supplies*<br>*98 Middlewich Road,*<br>*Rudheath, Northwich,*<br>*Cheshire CW9 7DA.*<br>*Tel. (0606) 48511*<br>*Fax (0606) 48512* |
| *Price* | *£99.95 inc. VAT*<br>*£48.00 upgrade*<br>*from Rhapsody 2* |

Having said that, Rhapsody will nevertheless give a very reasonable printout if you don't require or expect publishing quality, and given that it will also do part-extraction, its abilities are ideal for a school environment, say, where pupils can put in their music and print out a full score, or a part for each player. Note, though, that such niceties as bowing marks for stringed instruments are not provided.

Rhapsody is also the ideal companion to a MIDI interface, and above all is a lot of fun to use. For anyone who wants to put in notes, see them in standard notation and play them back via the computer, Rhapsody 3 has to be the program to buy. uR

# The SyQuest 105Mb Removable Hard Drive

*Do removable drive systems offer an acceptable and safe alternative to fixed hard drives? Alan Bonsor finds out.*

For the last 12 months or so, I have approached the daily ritual of powering-up my computer system with a great deal of trepidation; the reason being that my 100Mb SCSI hard drive has the disturbing habit of not always realising that its services are required. Not only did it frequently refuse to start, but when it did, it believed that it was a 120Mb hard drive. Any file that was saved onto this non-existent 20Mb section would appear in the directory structure, but would be unreadable, uncopyable and undeletable. The only way to remove such a file was to use *Archimedes Disc Rescue* to delete the file's directory entry.

Faced with the daunting prospect of having to backup the hard drive onto a few hundred discs, reformat it, and then restore all the files again, I jumped at the opportunity to review the SyQuest 105Mb Removable Drive system.

Removable drive systems have been used on the Apple Macintosh for many years, primarily in the DTP field for transferring large Postscript files from computer to imagesetter. Until fairly recently, their exceedingly high prices and concerns about their reliability ensured that this was about the only market in which they were used.

However, in line with the almost never-ending fall in cost and size of high capacity, fixed hard drives, removable drives are now becoming an increasingly viable alternative to both standard drives and tape streamers.

## REMOVABLE vs FIXED

For those of you who have never seen a removable drive, a brief comparison may prove useful. A fixed hard drive, whether it be $5^{1/4}$, $3^{1/2}$ or the newest $2^{1/2}$ size, always consists of a number of metal discs that rotate at high speed inside a sealed container. A magnetic read/write head floats a fraction of a millimetre above and below each metal disc, storing and retrieving information in magnetic patterns. Three to four years ago, one of these metal discs could only reliably store about 8Mb of information, with the result that a 40Mb drive would contain 5 discs and ten heads. Today, through advances in technology, a much smaller disc can hold more than 100Mb, and it's this that has made removable drives a practical storage solution.

A removable drive system consists of two components: the drive unit, similar in design and dimensions to a disc drive, and a plastic cartridge containing a single metal disc. The internal version of the SyQuest 105Mb will fit comfortably into the spare drive slot in the A5000.

The SyQuest $3^{1/2}$ cartridge is marginally larger than a $3^{1/2}$ floppy disc, and weighs only 79g. Like a floppy disc, it also has a metal flap at the front, which is opened as the cartridge is inserted into the drive unit. Although this flap protects the disc from dust and dirt, it would be highly unadvisable to leave the cartridge lying around outside its storage box.

## RELIABILITY

The older $5^{1/4}$ versions of the SyQuest were prone to suffer from reliability problems at high temperatures. This is no longer a problem with the $3^{1/2}$ system, as it draws less than a quarter of the power of the $5^{1/4}$ version. The cartridges are said to be highly reliable, so much so that SyQuest, the manufacturers, offer a 5-year guarantee on the discs. That said, it is still very easy to corrupt information stored on them. I learnt very quickly that you should never move the drive unit around while the cartridge is still inserted, even when the system is switched off. You won't damage the cartridge, you'll just lose all the information on it. Outside the drive unit, the cartridge is very robust, and will provide an uncomplaining companion on your travels.

## CONNECTIVITY

Two different versions of the SyQuest 105Mb system are available, either as internal or external units. The first is an IDE drive, ideal for A5000 owners. As stated previously, the unit fits snugly into the A5000's second drive slot, with just the colours of the front panels not quite matching. By the time you read this, a software patch should be available that will solve one of the only problems associated with the IDE version - in its current form, a bug in ADFS prevents you from changing cartridges without turning the computer off and on again.

Amazingly enough, the system is said to work with most other IDE interfaces for the Arc, which is

more than can be said of many hard drives (though I strongly recommend that you check this point with your dealer before opting for this route).

The only other minus point about the IDE system is that it runs approximately 20% slower than the SCSI version. This is offset, however, by the fact that it is considerably cheaper than the SCSI unit.

As I already had a SCSI card in my 410, I opted for an external SCSI SyQuest system. A second factor that prompted me to choose the SCSI system is that it is totally compatible with the Mac, which I also use, and can be moved between the Arc and the Mac quickly and easily. The drive unit is a little grey box, more colour co-ordinated with the Mac than the Arc, and roughly 5" wide, 10" long, when attached to the massive SCSI connector, and 3" high. On the back of the unit is an inconveniently located power switch, two SCSI sockets, the second of which can be used to daisy-chain other SCSI devices or hold the SCSI terminator, and a SCSI ID selector button - no fiddly links to change.

## IN USE

Connecting the unit to the computer should be a relatively simple operation. The system supplied by Norwich Computer Systems contained a cable for my SCSI card, and a manual documenting the various configuration options for different makes of SCSI cards. Once I had plugged the drive unit into the computer, a single *Configure command placed a second SCSI drive icon on the icon bar.

Not realising that NCS had already formatted the cartridge supplied with the drive, I attempted to format it with Lingenuity's *SCSIForm* program, and ran into a very obscure problem. Although I could use the cartridge, the formatting software refused to format it, and only after lengthy discussions with both NCS and Lingenuity did we discover that the problem was caused by the cartridge being pre-formatted on an IDE drive. Once I had received a totally unformatted cartridge, the formatting software worked perfectly, and I was able to use the cartridge as a normal hard drive. The first major task I undertook was to backup my 100Mb hard drive, reformat it and restore all the information again - an operation that was performed flawlessly. It is now a painless exercise doing a weekly backup using the *Newer* copy option.

I use the second cartridge for holding a massive collection of fonts, clipart and public domain utilities, as well as various large applications. With all files, excluding the fonts, compressed, I still have over 50Mb of free space on the cartridge. I would, if I could, use this free space for transferring Postscript files to the repro-house. Unfortunately, they use Macs, and there is currently no way of reading from or writing to a Mac-formatted cartridge. I do know there are companies working on software to allow this, but the rumour that RISC Developments is developing such software is false.

## SPEED

With their 8-bit SCSI card, Lingenuity's Speed software gave read and write speeds of approximately 749Kb/s and 471Kb/s respectively, the latter being considerably slower than on the 100Mb fixed drive. I recently upgraded to a 16-bit *Rapido* SCSI card, also from Lingenuity, and witnessed a staggering speed increase on the SyQuest, with both read and write times almost doubled - very useful for full motion video digitising and sound sampling. Even when using Computer Concepts' *Compression Filing System*, the read and write speeds are highly acceptable, with reading taking place at over 600Kb/s. Interestingly enough, the 100Mb hard drive benefits very little from the 16-bit card.

## THE VERDICT

So should you rush out and buy one of these drives? If you only require an extra 100Mb or so of hard drive space, then the SyQuest system is not really for you. Considering that you can obtain a 160Mb hard drive for under £300, the cheapest SyQuest 105Mb system at £455 inc. VAT offers very little competition. If, however, you expect your storage requirements to increase rapidly over the next few months or years, you require an easy-to-use backup system, and you want data portability, then the SyQuest 105Mb removable drive is definitely the system to go for. I certainly couldn't get by without mine.

*RISC Developments are also supplying the IDE version of the SyQuest Drive. For information on availability, contact Beebug at 0727 840303.*

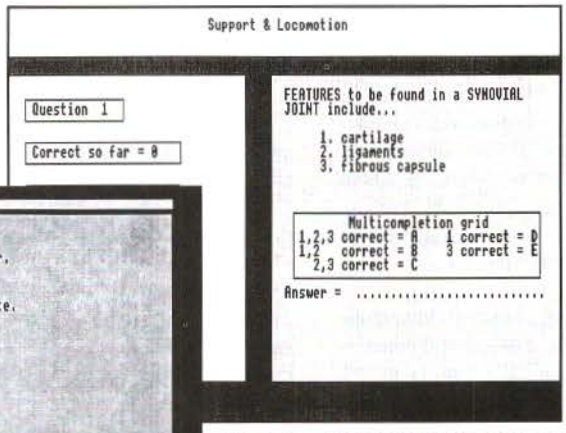
**PRODUCT INFO**

| | |
|---|---|
| *Product* | *SyQuest 105Mb Removable Drive* |
| *Supplier* | *Norwich Computer Services*<br>*96a Vauxhall Street,*<br>*Norwich NR2 2SD.*<br>*Tel. 0603 766592*<br>*Fax 0603 764011* |
| *Prices* | *SCSI external + cartridge: £510 inc. VAT*<br>*SCSI internal + cartridge: £430 inc. VAT*<br>*IDE internal + cartridge: £395 inc. VAT*<br>*105Mb Cartridge: £75 inc. VAT*<br>*The prices for the SCSI versions exclude the cost of a SCSI card.* |

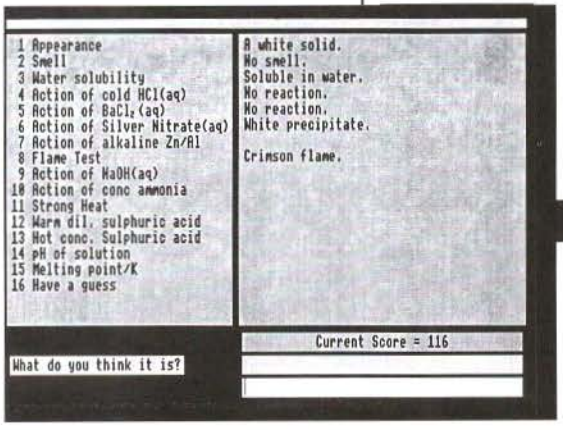
# Educational Software at Home Part 3: Science and Technology

*Chris Drage homes in on 'Control' applications as the ideal model for home education.*

This month I focus on what has become quite a controversial subject: science. Rather than suggest a range of software across broad age ranges, I want to discuss how, as a family, you can embark on a computer-based project suitable for top primary and secondary aged youngsters. I will then look at sources of software that can assist older pupils consolidate GCSE and A-level science work at home.




**GCSE revision (G.A.Herdman)**




**Educational games (G.A.Herdman)**

Science and technology go hand in hand, and one area where both unite successfully with the assistance of a computer, is in 'control technology'. Control technology involves the use of a computer to control a model containing mechanisms, in response to information gained from a sensor. Technology is about building working models from the real world using scientific and mathematical principles which children understand and can apply. The approach is based on active, child-centred, first-hand experience based on the real world. Control technology is an integral part of the Technology National Curriculum.

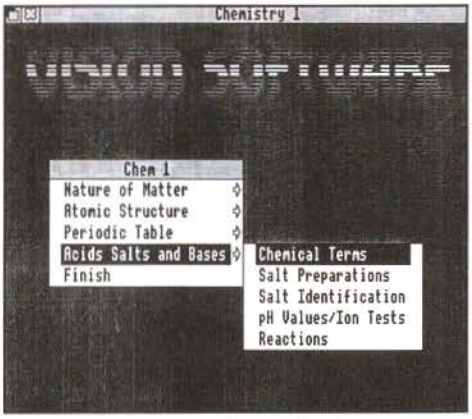
Before embarking on any control work in the home there are certain prerequisites. Above all, there must be a firm commitment from the parent(s) to work with their child(ren) in a joint project. Controlling models is not something you can just switch on and let them get on with! If you can learn together, well and good, but I can't over stress that a commitment is required. After all, there are real and valuable projects that can evolve - control of a plant propagator or small greenhouse, or a model railway system where there are automatic signals, crossing gates, swing bridges and train movements.

To get your computer to interface with motors, lamps and sensors, a control box and software are required. The availability of suitable building materials will depend largely on your own situation - DIY folk will undoubtedly have various materials to build with. However, what if you are a beginner with little knowledge and few skills? Why not start with Lego?

Lego Dacta's Control Lab offers everything you need to get started. It has one major advantage over all other off-the-shelf products in that it is based on a construction material which is popular with children and adults worldwide. Lego Dacta has evolved from the familiar Lego building system and includes elements which extend its application into areas like structures, mechanisms, driving systems, manual and computer control.

The complete system, suitable for Acorn's 32-bit machines, comprises an Interface 'B' controller (£130.00), software and literature (£85.00), Technology Models Technic kit (£120.00) and connecting cable (£15.00). In short, everything required to monitor and control devices and systems can be purchased for £350.00. Too

much? Consider how much is spent on Nintendos, Game Boys and their accompanying games!




**Chemistry revision from Vision**

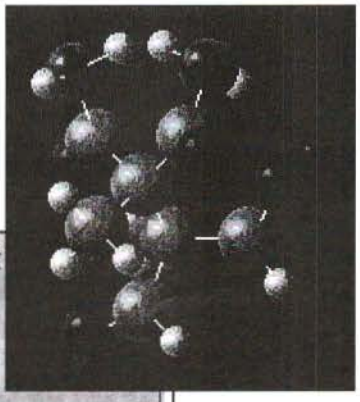
Seven models can be built representing examples from manufacturing, the environment and transport; and include a robot arm, conveyor belt, vending machine, greenhouse, scanner, wheelchair and car testing station. All are to be monitored and controlled, and none of the models are particularly complex to construct. Each model is representative of a particular control system. Using the new Lego 9v system, Control Lab has colour-coded touch, temperature, angle and light sensors, all of which connect with the new, fool-proof connector bricks.

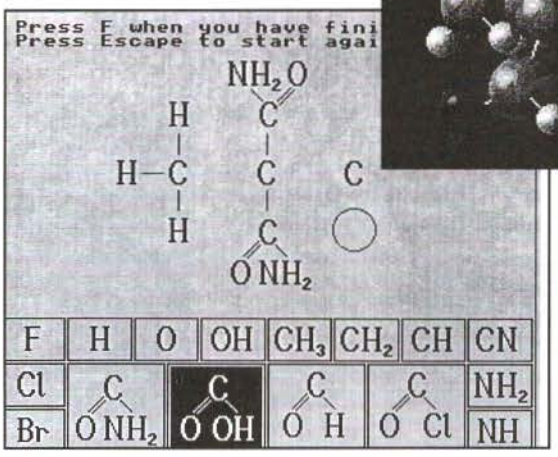
The software, based on the ever-popular LOGO, is very faithful to the RISC OS environment, having excellent setting up, programming and reporting features. It certainly takes LOGO into a new dimension with buttons, pictures, graphs and even a simple word processor to complement what is in effect a fine implementation of the language. Children 'connect up' the system by dragging icons representing the various outputs and inputs to appropriate places on a graphical representation of the controller. Then, at the procedures level, instructions are given using simple LOGO commands to to control the model, e.g.

```
to first go
talk to "lampA
on
wait 60
off
```

Control Lab employs a problem solving approach providing instant feedback, which in turn encourages experimentation and investigation. Projects can be completed quite quickly - the 'Quick Start' cards allow rapid progress through the software, as well as though the construction and control procedures. Control Lab is simple to understand, reliable and robust, and is ideally suited for control projects at home. More importantly, with Control Lab, children are actively engaged in challenging situations - planning, designing, making decisions and evaluating. These are all technological processes in the context of applied scientific knowledge. Try it - it's fun.

In the later stages of secondary education, theoretical learning takes on a new emphasis. Too many pupils opt out because it all seems too remote and unduly complicated, yet the *right* computer program, introduced when difficulties arise, can help nurture understanding and develop confidence. At home there is more time for reinforcement and revision activities, and suitable software can provide useful reinforcement and application of concepts learnt in the classroom.

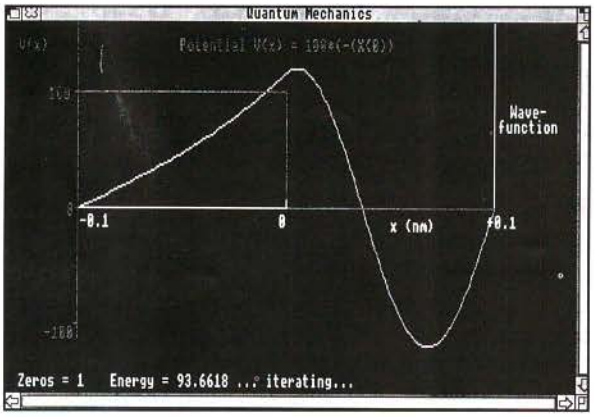





**Symbolic and 3D visual representation of a molecule (AVP)**

Although such software is not in abundance, and is seldom, if ever, reviewed in the press, there are nevertheless some very useful programs about, which address specific areas in the sciences. Vision Software, G.A. Herdman and AVP are your first ports of call.

Vision Software are leaders when it comes to *study* software, covering a range of subject areas including chemistry, physics and human biology. Their science software uses a consistent interface which aims to increase and consolidate student knowledge, and is suitable for school and home use. Chemistry Units 1-4, Human Biology Units 1-2, and Physics Units 1-4 are three suites of science programs in the Vision range which are ideally suited for revision work or consolidation. Their overall design is sound, and aims to maximise student interest and learning. The subject material in each title is presented as a number of question and answer topics in a variety of formats. The results of each session can be printed out to help assess progress.




**Quantum mechanics from AVP**

**PRODUCT INFO**

For more information contact:

Lego Dacta
Lego (UK) Ltd
Ruthin Road, Wrexham,
Clwyd LL13 7TQ.

Vision Software (Disney Ltd)
Pilkington Ave,
Sutton Coldfield,
West Midlands B72 1LA.

G.A. Herdman Educational
43 St. John's Drive,
Clarborough,
Retford DN22 9NN.

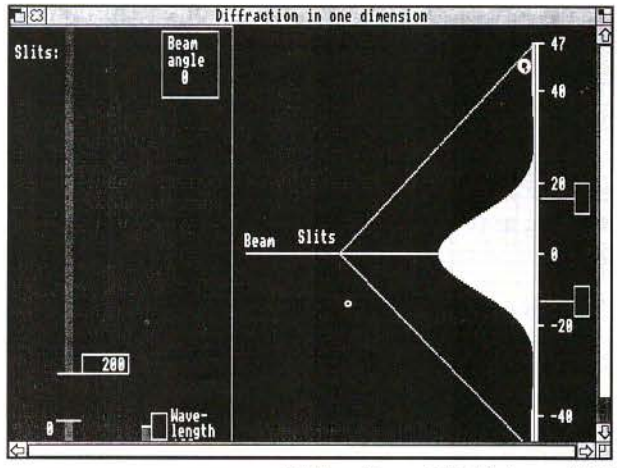
AVP Computing
Chepstow,
Gwent NP6 5PH.

G.A. Herdman Educational also offer a range of assessment programs suitable for GCSE and A-Level preparation, revision programs and progress monitoring. There are five packs covering major areas of Key Stage 3/4 science, each comprising specialist units focusing on particular subject areas. An average program offers over 160 questions with a good mix of question type. If you are not happy with the existing data, a question bank compiler is included. These programs are well designed and fulfil their role very well indeed. For an interesting variation try Herdman's 'Educational Games' pack. Who said chemistry can't be fun?

AVP Computing market a wide range of science software, some of which is suitable at the upper secondary level. Although primarily designed for classroom use, and not specifically for revision work, the manner in which specific topics are presented makes many of AVP's programs interesting and stimulating vehicles for learning. This is exemplified by:

| | | |
|---|---|---|
| Physics | - | Diffract (interference and diffraction of light) |
| Physics | - | Quantum (sub-atomic particles) |
| Chemistry | - | Atomic Structure (atomic theory) |
| Chemistry | - | 3D Molecule (molecule designer) |

Each successfully makes complex subject matter palatable, by utilising a range of control options and animated graphics. There are many such titles in the AVP range which are worth purchasing, if only to help a student over a difficult patch.




**Diffraction of light from AVP**

Physics and chemistry are not always the easiest subjects to master, but the help offered by computer software like Vision, AVP and Herdman, when used in the home where time is available, could just be what's needed to help a tentative son or daughter over a few hurdles, and allow them to gain confidence. We all want to assist our offspring in whatever way possible, and if the home computer can be pressed into service as a tutor, then the cost of the software is money well spent.

# A New Look for your Desktop

*David Spencer gets to grips with NewLook from Acorn.*

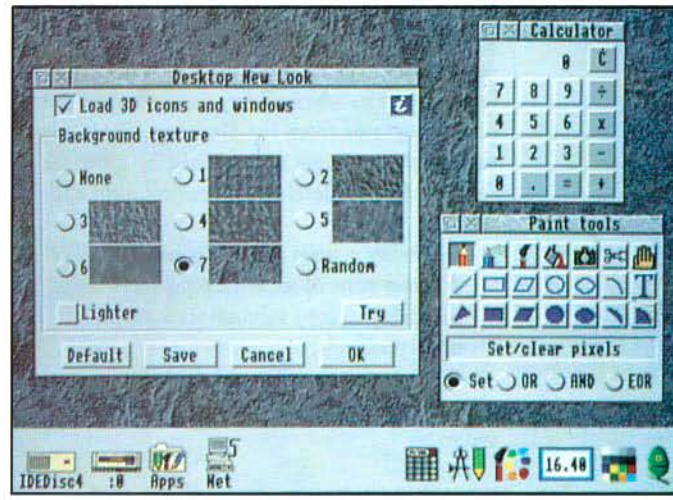
By the time you read this, you may well have already got a copy of NewLook, the Acorn utility that gives the RISC OS 3 Desktop a 3D look. NewLook was given away free in large quantities at the recent Acorn World exhibition and for those who missed out, it is supplied on this month's double magazine disc (this offer is only open until January 31st 1994). NewLook is also supplied with the RISC OS 3 Style Guide. What NewLook does is to provide a new set of window tools (title bar, scroll bars etc.) which have a 3D look, a new set of 3D Desktop sprites, and a number of patterned backgrounds. In this article we shall look at how to get NewLook up and running.

The first warning to heed is that if you don't have a hard disc in your computer, or if you only have 1Mb of RAM, you should seriously consider not using NewLook. The reason is simple - all the new fancy sprites and borders take up as much as 150K of RAM in your machine, and are also slow to load from floppy. Having said that, if you insist, NewLook will run on any RISC OS 3 machine.

Before starting, copy NewLook from floppy into the root directory of your hard disc. This is because when you set it up, it writes back the set-up to itself, so you must use a working copy and not the original. When you run NewLook, you will see the dialogue box shown in figure 1. The option button at the top specifies whether the 3D look is used, or the standard 2D appearance. Turning this on, which is the default, will set the 3D mode of operation.

Immediately below the 3D button is a display of the possible desktop backgrounds available. There are seven possible patterns, or you can opt to have none (a plain background). If you select Random, then one of the seven patterns will be loaded at random each time you start the Desktop. The Lighter button allows any of the background patterns to be lightened up a bit from their standard appearance. To get a feel for how a background will look, click on the Try button. This will set the background to the chosen pattern.

Having made your choices, there are a number of options. Clicking Select on OK will load in the appropriate set of sprites and tools, set the background and close the NewLook window. Using Adjust instead of Select will have the same effect, but keep the window open. Clicking on Save will have the same effect as OK, but also save the set-up for next time NewLook is used. Cancel will close the window without changing anything, and Default will restore a sensible set of defaults. Finally, clicking on the little blue info button in the top right-hand corner will run the Help application to give additional help on using NewLook.




**Newlook**

Once NewLook has been set up, it will be run automatically whenever the directory display containing it is opened. Assuming it is in the root directory of your hard drive, it will run as soon as you open the hard drive. When run automatically in this way, the sprites, tools and background are set up, but the NewLook window is not opened.

## MAKING APPLICATIONS 3D

It's all very well to have 3D windows, but it is also nice to have 3D buttons in application windows. NewLook does this automatically for the applications built into ROM, but others must be modified manually. The NewLook disc contains new window template files for the Apps1, Apps2

*Continued on page 35*

# Desktop Debugging

*David Taylor outlines alternative methods for tracking down those elusive problems.*

With the advent of RISC OS 3 more and more programmers are developing their programs using the newer generation of Desktop editors which allow you to edit and run Basic programs from the Desktop. There are numerous advantages to be gained by using the Desktop as your development environment such as:

the ability to open multiple windows on different parts of the same program,
the ability to copy subroutines from other programs,
the ability to move around the program using the mouse,

and so on.

## WHAT HAPPENED TO THE TRACE COMMAND?

However, there are also disadvantages. When a Basic program has completed execution from within the Desktop, it isn't easily accessible. And unless the program has been run from Basic, the debugger's favourite command LVAR is not much help. An additional problem encountered when running programs designed to be controlled by the Wimp Manager, is that it isn't possible to use the TRACE command. It is therefore easy to see that this is a subject which warrants some careful consideration.

Lee Calcraft's *Debug* application (RISC User 4:7 and The Wimp Programmer's Toolkit), which writes messages to the system variables, is well worth trying. This is, however, limited to ten short messages or variables. The alternative system (described below), which I am now using, requires little extra effort and will record an unlimited number of messages or even complete files.

## CREATING A TRACE FILE

Near the start of your program, after the line:

```
ON ERROR PROCerror:END
```

or its equivalent, open a file to the RAM disc (presupposing that you already have one configured). For example:

```
OSCLI "Create RAM:$.Detector"
OSCLI "SetType RAM:$.Detector Text"
clues%=0
clues%=OPENOUT("RAM:$.Detector")
```

The error handler *PROCerror* should contain the lines:

```
IF clues% BPUT#clues%,REPORT$+" at line
No."+STR$(ERL)
IF clues% CLOSE#clues%
```

If there is an END statement in the program, it should also be immediately preceded by the line:

```
IF clues% THEN CLOSE#clues%
```

You can now write messages to the *Detector* file from anywhere in the program using lines like:

```
BPUT#clues%,"So far so good"
```

or variables such as:

```
BPUT#clues%,"energy%= "+STR$(energy%)
BPUT#clues%,"filename$= "+filename$
A% = draw%!(loopindex%)
BPUT#clues%,STR$(A%)
```

If you put the line above in a loop, the contents of an array, or an entire buffer, can be written to the *Detector* file, and examined at your leisure. If the program crashes, at the very least you will find an error message in the *Detector* file. You do not have to delete the file before running the program again, as long as your boot sequence sets *Copy$Options* to include F(orce) overwrite. If the crash locks the computer up, pressing Break or Escape to recover will not disturb the Detector file, which can be found patiently waiting on the RAM disc more often than not.

One problem that may occur after a crash, is that the *Detector* file may be left open. To remedy this you must close the file. You can do this by entering:

```
RAM:CLOSE
```

at the command line. This closes all files on the RAM filing system, while remaining in the current filing system. You should note however, that the RAM disc will vanish if you use Ctrl-Break or Reset.

If your program locks up so badly that it is necessary to use such a reset, then a disc based *Detector* file, which will be closed automatically by the system reset, would be needed. If, however, you find that the Detector file is left open repeatedly after a crash occurs, it may be worthwhile amending the *DeskEdit.Data.Commands* file to include the line:

```
Close RAMfiles=\d RAM:CLOSE
```

This will make the *CLOSE* command available from the *DeskEdit* menu or keyboard shortcut.

I find that the ability to open a window holding the *Detector* file, alongside another window containing either the program itself, the original data, or a previous version of the Detector file, can be very useful indeed when attempting to fathom what is going wrong.

### SPOOLING ASSEMBLER LISTINGS

When using the Basic Assembler, the listing produced is sent directly to the screen. This often flashes by in a task window and is lost. This too can be gathered up and sent to the RAM disc by inserting the following lines before the procedure which invokes the Assembler:

```
OSCLI "Spool RAM:$.Listing"
OSCLI "SetType RAM:$.Listing Text"
```

Make sure the file is closed afterwards by putting the line:

```
OSCLI "Spool"
```

both immediately after the end of the assembly routine, and also in the error handling routine. You should then have a listing of the assembled routine, showing all the relevant addresses and assembled machine code, in the file *Listing* on the RAM disc. This file can be examined from the Desktop without having to produce a hardcopy. Should you require a printout, you can of course just drag the text files to your printer driver. *uR*

## A New Look for your Desktop (continued from page 33)

and Support disc, and all that is needed to make the standard applications 3D is to open the directory containing the applications; open the corresponding directory on the NewLook disc; and drag all the files from the latter to the former. It's a good idea to write protect the NewLook disc before doing this, in case you get the copy the wrong way round. Also supplied on the disc are copies of the original templates so that you can return to the 2D look if desired.

To make other commercial applications 3D, you must contact the supplier of them to see if they have an upgraded version of the application that supports the new look. Some companies may charge for such an upgrade.

### AUTO-STARTING NEWLOOK

It's desirable to start NewLook automatically each time the computer is switched on. Indeed this is essential if you want the Filer and Task Manager applications to have a 3D look. To do this you need to create a new separate boot file on your hard disc, as the commands must be executed before the Desktop is started. In the following explanation we assume that you already have the computer set up to auto-boot and run a desktop boot file called !Boot. Start off by renaming !Boot to !DeskBoot. Then, using Edit, create the following Obey file and save it as !Boot:

```
RMLoad adfs::4.$.!NewLook.ROMApps3D
RMLoad adfs::4.$.!NewLook.BorderUtil
Run adfs::4.$.!DeskBoot
```

This assumes that your hard disc is adfs::4. If this is not the case, then you will need to modify the file accordingly. More details are given in the help file within NewLook. Now, each time the computer is started, the Desktop will start with a 3D look.

### CAVEATS

There are a few points to note when using NewLook. Firstly, for it to work properly, the Pinboard module must be active. If you get a strange error mentioning 'backdrop', press F12 and enter the command:

```
*RMReinit Pinboard
```

Then restart the computer with a hard reset. Secondly, like SetIcons, NewLook provides separate high and low resolution sprites. You should therefore ensure that when you first set up NewLook, you are in the screen mode that you intend to use for most of the time. Finally, make sure you delete any copies of SetIcons lying around, as they will happily reset all your nice 3D sprites. *uR*

# Enter the Crystal Maze

*Alan Bonsor finds out if he's got what it takes to crack The Crystal Maze.*

## FIRST IMPRESSIONS

Sherston Software seems to have spared no expense in bringing The Crystal Maze to the Archimedes. About the only feature missing from the game is the show's eccentric ex-presenter, Richard O'Brien. I'd actually be quite surprised if he didn't make an appearance sometime during the game.

**A futuristic mystery**

Well it's finally happened. *The Crystal Maze* computer game has been launched. Based on the very popular Channel 4 television adventure show, The Crystal Maze involves up to six different players solving mind-bending puzzles and challenges set in the Aztec, Ocean, Medieval and Futuristic zones. A player completing a mental, physical, skill or mystery game is rewarded with a crystal,

**Deep inside the Aztec zone**

worth five seconds inside the Crystal Dome. The object of the game is to obtain as many crystals as possible, building up enough time in the Crystal Dome to grab 100 gold tokens. Collect 100 or more tokens, and you've cracked The Crystal Maze. I have now spent the past week playing this game, and the game has lost none of the appeal and excitement of the TV show.

The first thing you notice about The Crystal Maze is its packaging: It's excellent. The eight-sided glossy case and manual reflect the concept of the game, and together form an ingenious protection system worthy of The Crystal Maze itself. A colourful poster showing the four zones in the game, a registration card, and three discs containing the game itself, make up the rest of the package.

## INSTALLATION

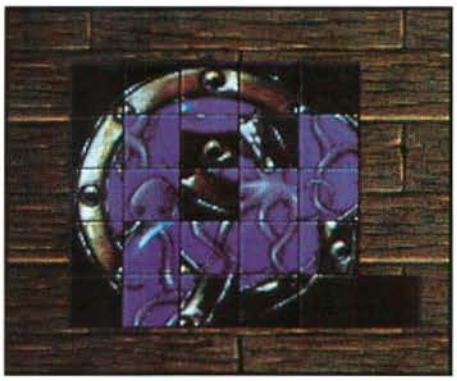
The Crystal Maze can be used on any Acorn 32-bit computer running RISC OS 2 or greater. It will run from both floppy or hard disc, although I was not impressed that I had to modify its *!Run* file to this. The *!Run* file also needs to be modified if you use a Leading Edge joystick interface. Try as I might, however, I was unable to get The Crystal Maze and my Leading Edge joystick interface to work together.

Double-clicking on the Crystal Maze icon launches you into the very impressive loading screen and animation - a spinning crystal rises from a pool of water, accompanied by the faithfully reproduced Crystal Maze theme tune. This is followed by the main screen, from which the various configuration options can be set, your team can be chosen,

and each of the four zones accessed. The screen also contains an icon for returning to the Desktop. Almost all aspects of the game can be customised, including sound-effect and music volume, the level of difficulty, which direction you want to travel through the zones in, and which input device, keyboard, mouse or joystick, is used for each section of the game. You can also choose to play the game in *practice mode*, where you can attempt each section as many times as you like. Reaching the Crystal Dome is likely to require a considerable amount of time in this mode.

Clicking on the *Player Selection* icon allows you to select your six person team from twelve rather odd-looking characters. Each character has different strengths and weaknesses, making them more or less suitable for each of the different games. The only way to discover their characteristics, however, is to play the game. The manual includes ten tips on cracking The Crystal Maze, the first of which is "Don't judge a book by its cover." Heed this advice well when choosing your team.

Once you have chosen your team, or you've decided to use the default one, simply click on the first zone you wish to enter. You'll be presented with a stunning atmospheric screen for that zone. Inside the zone, decide which type of game you want to play, and which team member will tackle the challenge. From then on it's a race against the clock to complete the game and collect the crystal.



**Can you complete the Octopus Shuffle?**

Although the various physical, skill, mental and mystery games vary according to the zone, they always follow a similar theme. The physical challenge involves you negotiating numerous hazards in a ladders and levels type game. The skill games usually challenge your hand-eye co-ordination - try your hand at archery or throwing a ball into a moving mouth. The mental games really do tax your thinking powers to the limit, and range from solving a magic number puzzle to completing the sliding-block Octopus shuffle. The mystery games require a certain amount of detective work, and a lot of luck.

**Cryptic clues in cryptic puzzles**

Depending on which difficulty level you've chosen, the various games vary from moderately hard to absolutely mind bending - I have yet to collect more than four crystals in one session.

## VERDICT

I have only discovered one problem with The Crystal Maze - it crashes on my system on a very regular basis. I phoned Sherston Software to find out if they knew of any bugs in the code that would cause such anti-social behaviour, and the first thing they asked was whether I had an Ethernet card in my system. Oddly enough I do. It seems that The Crystal Maze will not work correctly on any system that contains an Ethernet network card.

**PRODUCT INFO**

| | |
|---|---|
| *Product:* | *The Crystal Maze* |
| *Supplier:* | *Sherston Software Ltd*<br>*Swan Barton,*<br>*Sherston,*<br>*Malmesbury,*<br>*Wiltshire SN16 0LH.*<br>*Tel. 0666 840433*<br>*Fax 0666 840048* |
| *Price* | *£39.95 inc. VAT*<br>*£34.00 ex. VAT* |

That aside, The Crystal Maze is fantastic. The graphics and sound are stunning, the puzzles and games are very playable and challenging, and the presentation and packaging are of the highest standard. What's more, it provides all the excitement and entertainment of the TV show.

# What's Cooking at Clares?

*This month, Dave Clare, Managing Director of Clares, chats about his company, product upgrades, the Tube, Robert Maxwell, joystick standards, and other interesting nuggets of information.*

This is great, a chance to speak my mind. Then again maybe I had better watch what I do say just in case anybody reads this.

Let me start off by saying that I am not going to mention the Tesco scheme - oops.

In the October issue, Charles Moir took the opportunity to talk about Computer Concepts' view of the world, and I suppose that I should devote some of my ramblings to this same cause. As many of you will know, Clares, through the programming talents of CRM Ltd, were involved in the *Advance* project with Computer Concepts, Iota and Acorn. *Advance* is a very good integrated package with word processing, database, graphing and spreadsheet. Each element is based upon the full blown versions from the relevant company. I have taken the space to explain this again because so many people have not heard of *Advance* and have no idea what it is. Why is this?

There have been favourable reviews in most magazines, Acorn's sales staff presumably show it off, there has been (some) advertising and yet most people that we talk to have not heard of it. This is a worrying trend overall and not just for *Advance*. One reason is the reduced number of people buying the Acorn specific magazines and the consequent ineffective advertising in these magazines. New and innovative suggestions for contacting owners of Acorn computers are welcomed.

Where is Clares going? As always, we intend to continue providing innovative and affordable software for the Acorn RISC OS range of computers. Yes, we were quiet for a while but this was because we were working on new products with much higher specifications and we did not want to say too much about them and tip off our competitors. You can now see some of these products on the market in the form of *Topographer* (a totally unique product on any platform), *ProArtisan 2* (take a look at the rave reviews of this one), *Rhapsody 3* (yet more rave reviews for this). Still to come are *Schema 2* (a full launch at BETT 94 with existing users getting it before the official launch), *NightSky* (THE astronomy program - see the review in this issue), *Plot* (a graph plotter and equation solver), *Card_Shop* (one for the kids to make their own greetings cards) and *Spooler* (a cheap way of increasing the printout speed of dot matrix and inkjet printers). And these are only the ones that we are talking about!

To clarify the situation for you, the customer, I would like to take this opportunity to state what our upgrade policy is for the inevitable version 2, 3 .... etc. of our packages.

Any upgrades to software that are purely bug fixes or minor enhancements are free of charge upon receipt of the original disc, but please check with us first. Other modifications to programs, such as changing programs to work with new operating system releases, are charged an administration fee of £5, which barely covers our cost. We could avoid this fee by charging you more for the program in the first place but we do try to keep initial costs down. To support this argument just take a look at our prices when compared to competing packages and remember that our prices INCLUDE VAT.

Major enhancements to programs are usually charged at the difference between the two versions plus £10. For example, *Rhapsody 2* is £61.95 and *Rhapsody 3* is £99.95, so the upgrade is £48.

Major or total rewrites of packages do not fall into the above categories. For example *ProArtisan 2* is a complete rewrite with no original code surviving. However, we do offer special upgrade terms within a specified time limit. In the case of *ProArtisan 2* and *Schema 2* existing users can get a 50% discount by returning their original disc. This makes the price for these two just £67.50 each instead of £135 each. We do try to be fair to our valued customers.

Acorn seem to be taking an aggressive stance in the market lately. We all know how strong Acorn is in education, although we must be aware of the massive threat now posed by the PC compatibles. The one major advantage that

Acorn has is the huge specialised software base for education. Acorn is now attacking the 'edutainment' (I hate that word) sector and is making a determined effort to break into the home market. They have made a video called *The Home Computer Minefield*, which is being sent to potential customers, and this appears to be working well from where I am sitting. Another market that they are putting a lot of effort into is Germany. Hang on, aren't both of these markets dominated by the Amiga? Yes they were, but Commodore has got itself in a bit of a mess and Acorn is taking the opportunity to step in. Well done Acorn and good luck. We are all in the Acorn world because we like the machine and its capabilities. It would be nice to see that vindicated by Acorn breaking into the mass market at last.

Acorn is really looking the part, especially with the new offices which are very impressive. It has to be better to receive important visitors at the new office rather than the old pump house that was the Fulbourn Road building. I just hope that the new offices are big enough, what with all this potential increase in market.

Other markets that Acorn is trying to improve are Australia and New Zealand. Hello to our Antipodean friends and thanks for the hospitality that we received on our last trip. The folks down under are generally very knowledgeable about Acorn, at least those that have heard of Acorn are. Keep up the good work all you Acorn personnel and you Aussies can think yourselves lucky that you got the Olympics. Can you please arrange the Acorn Australian Computer Conference to coincide with the Olympics?

Quite a few people have asked how we got into the business. Like most people I started the company almost accidentally because I liked the Acorn BBC micro. After many nights hunched over a ZX81, complete with 16k RAM pack and carton of cold milk to stop it crashing, it was a real luxury to get the BBC. My first venture was providing cassette leads. The ones supplied with the Beeb came with a plug on one end only. I had a girl making the cables which I then sold to dealers, mainly Northern Computers of Frodsham.

This proved very lucrative and in the end I had a company in London making them up in their thousands. From there I started making joysticks with a friend (anybody remember the BeebStick in its orange box). The only problem was that there was no software to make use of them. It was then that I met Peter Henry and we launched Grafkey followed by Grafdisc which made use of joysticks. Peter went on to write the hugely successful Replica range of programs and we were into software in a big way.

One humorous story about the joysticks was that there was no defined standard and so we took our lead from the specifications for the analogue port. We assumed that the values read from the port would be 0 bottom and 65,000 top and 0 left with 65,000 right. However, when Acorn eventually produced their joystick it read the opposite way for left and right. When I rang them, there was a deafening silence whilst somebody went off to check. When he came back he said 'Er well yes you're right but as we've got thousands of these joysticks this will have to be the standard'. So we modified ours. It was interesting that the imminent release of many joystick compatible Acorn games was put back for a few months - I wonder why.

Another milestone for us was being commissioned by Mirrorsoft to write Fleet Street Editor for the Beeb. This was a superb package for its time but it was a pity that Mirrorsoft was owned by Mr Maxwell. His attitude and business practices filtered down through the company and the demise of the Mirror Group came as no surprise. Companies in the group would move without notice, different divisions would be responsible for paying us from one month to the next, so finding out who to chase for the unpaid royalties was a nightmare, and I am sure that we never did get paid what was due to us. Incidentally the programmers of Fleet Street Editor were none other than Frank Dart and Jon Warmisham who also wrote Artisan, Artisan 2, ProArtisan and ProArtisan 2.

The Beeb was a great machine, but looking back, was £800 for a twin 80 track double sided drive that gave 800K good value? That's £1 per kilobyte and now we can get hard drives at less than a pound per megabyte. That's progress.

Clares were involved early on with the Archimedes and it really was an exciting time. Our first Arc had to be connected to a Master via the Tube bus as the Arc did not have drivers for the keyboard or disc drives. Despite this we managed to get the original Artisan package out before the Archimedes itself was launched. We have been devoted to the Archimedes ever since as it is a superb machine to work on. But then I don't need to tell you that, do I? *uR*

# RISC User Disc December 1993

## The RISC User Morpher

Create the sequel to *Terminator 2* or *Jurassic Park* with the stunning *Morph* application. Morphing is the technique used to transform one image into another in a series of intermediate steps. The results can be absolutely breathtaking. The *Morph* application, on the magazine disc, and the morphing example and sprites on The Christmas Disc, accompany this month's article about image morphing.

## Foreign Image Files

The *PC Emulator Survival Guide* in this month's magazine covers the problems associated with converting foreign image files from the PC to the Arc.

The *PCFiles* application contains several images in GIF, PCX and Windows BMP format, illustrating the various techniques described in the article.

Various DOS applications are also provided for examining the image files under the PC Emulator, and the article explains how to view the images using software supplied with RISC OS 3.

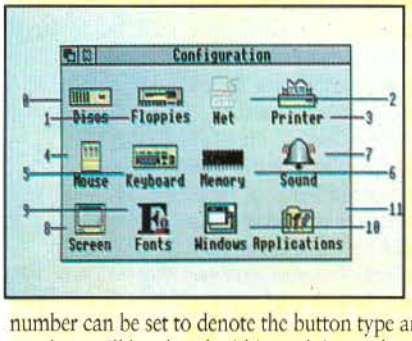
## Help Demonstration

*HelpDemo*, illustrating the *Wimp Topics* article in this month's magazine, demonstrates how to provide interactive and context sensitive help for Desktop applications, via the standard *Help* application.

## Sprite Displayer

*Display* is a demonstration application that accompanies this month's *Desktop C* article. *Display* shows how sprites can be displayed in a window, using the ColourTrans module to approximate the colours required by the sprite.

## ADDITIONAL ITEMS DESCRIBED IN THE MAGAZINE



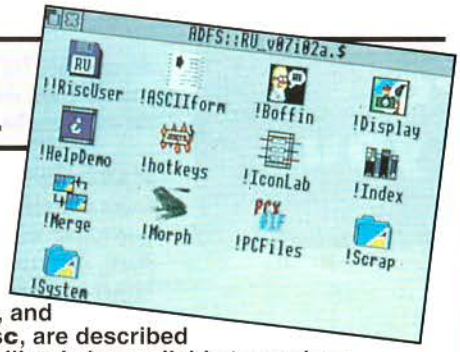

## Icon Labeller

*IconLab* is a powerful programmer's utility for capturing any window and labelling or renumbering its icons. A sprite is created containing a snapshot of the selected window, and each icon it contains is neatly labelled with its icon number. A template file can be loaded if icon renumbering is required, and the colours of each icon number can be set to denote the button type and justification of each icon. Icon numbers will be placed within each icon where possible, or aligned horizontally or vertically around the window, so that all icons in a window can be tidily labelled. Switching off all labelling options provides a convenient method of taking screenshots of windows. The window and labelled icons can be saved as a sprite file, and printing this sprite will provide you with an excellent record of the icons in any template.

## Boffin

*Boffin* is a high quality graphical adventure game to keep you entertained over the Christmas break. Written by the author of *Wraith*, *Boffin* is a challenging ladders and levels game containing dozens of fiendishly difficult puzzles that must be solved in order to complete each level. Can you guide the professor to safety?

**This action-packed dual disc pack costs just £4.75 inc VAT.**



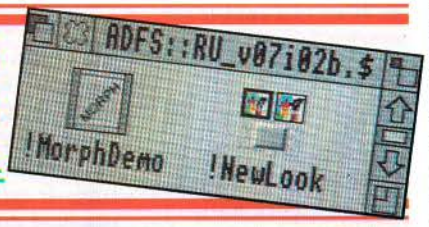

As a Christmas bonus, we are supplying two discs this month for the normal single disc price. The contents of both the **RISC User 7:2 magazine disc**, and **The 1993 Christmas Disc**, are described here. The Christmas Disc will only be available to readers purchasing the 7:2 magazine disc before the 31st January 1994.

## Beat the VAT Man

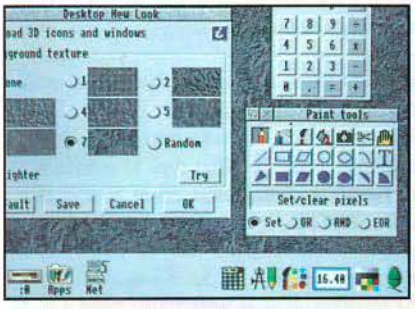
Use this small application to keep track of all your VAT payments and keep the VAT man happy.

| DATE | SUPPLIER | TOTAL | ZERO | STD | EXPENSE | VAT |
|---|---|---|---|---|---|---|
| 03/11/1 | Crosbie | 127.98 | - | - | 111.29 | 16.69 |
| 13/11/2 | Lynstat | 74.19 | - | - | 64.51 | 9.68 |
| 25/10/3 | Lindsay | 404.23 | 404.23 | - | - | - |
| 22/10/4 | Lindsay | 301.73 | 301.73 | - | - | - |
| 29/11/5 | Lindsay | 431.44 | 431.44 | - | - | - |
| 26/11/6 | Lindsay | 379.56 | 379.56 | - | - | - |
| 30/11/7 | Lindsay | 220.30 | - | 191.52 | - | 28.78 |
| 23/11/8 | Lindsay | 129.47 | - | 112.59 | - | 16.88 |

# The CHRISTMAS DISC



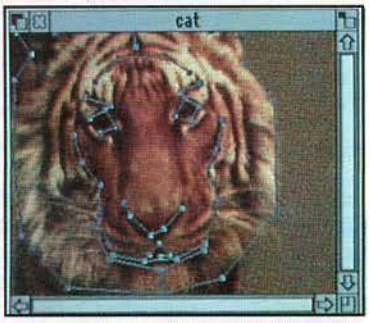

## RISC OS 3 New Look




Supplied under agreement with Acorn, the NewLook application provides a new appearance for the RISC OS 3 Desktop. Acorn handed NewLook out to all visitors to Acorn World '93, but for those of you who didn't attend the show, The Christmas Disc and the Using NewLook article in the magazine could be your first introduction to this application. It provides attractive new 3D templates and icons for the RISC OS 3 Desktop and its standard applications, and automatically selects between low and high resolution icons when you change mode. NewLook also provides a range of attractive backdrops for use with the Pinboard or your own sticky backdrop application.

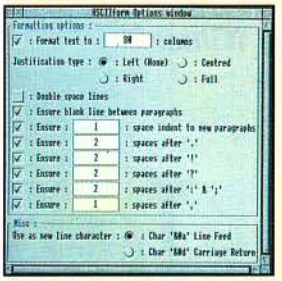
## Morphing Demonstration

The Christmas Disc contains a excellent fifteen frame animation demonstrating the power of the RISC User Morpher, supplied on the magazine disc. The disc also contains eight different sprites for you to use in your own animations, as well as the control point files, so that you can immediately load the files into *Morph* and watch them being morphed.




# BONUS ITEMS

## ASCII Text Formatter




*ASCIIform* is an excellent utility to use beside a text editor such as *Edit* or *DeskEdit*. It enables you to quickly format ASCII text files, allowing text justification, column formatting and the standardisation of spacing between punctuation marks. Text can be left, right, centre or fully justified, while column formatting automatically wordwraps at the end of each line. The number of spaces following various punctuation characters, and the number of lines following each paragraph, can be easily specified and changed.

## Hotkeys

*Hotkeys* will provide a powerful extension to your Desktop. It allows you to perform common Window and Filer operations, such as closing windows, iconising them, toggling their size, moving them around the Desktop, changing their position on the window stack and even hiding them behind the Pinboard, through easy-to-access hotkey combinations - far quicker than using the mouse. Filer windows can also be opened for fast access to current, root or library directories.

## ArcScan Data

ArcScan Indexes for this month's RISC User and BEEBUG Vol.12 No.6.

# Into the Arc: Expanding your horizons

*by Mike Williams*

This month, I thought it was time we looked at something completely different within this series, and that is the question of expansion. What are the most obvious ways in which to expand your system from its initial configuration, and what are the choices?

It is important to recognise that not everyone has the same needs, so there is no one answer for everybody. But let's see what is possible, and what you need to consider.

## MEMORY

While the amount of memory needed by an Archimedes may be less than a PC or Apple Mac, because all the Archimedes built-in software runs from ROM, having enough memory is important for a number of reasons. The Arc is essentially a multi-tasking system. That means that you can have several applications installed and in operation at the same time, with the facility to pass information (files) directly from one application to another. We saw this in a small way in the previous articles which integrated the use of Draw and Paint. However, the less memory you have the fewer the number of applications which can be installed at one time. So if this type of operation is important to you, then you will need at least 2Mb of memory, and preferably more.

Memory also limits the size of file which you can work with. If you use a DTP package with particularly long documents, or with many sprites and other picture formats included you will again find that at least 2Mb of memory is essential.

More memory can also speed up your system, because, for example, more memory can be allocated for font caching, or for a RAM disc.

Memory upgrades are relatively cheap, certainly those that expand your machine up to 4Mb, while some companies now offer expansion cards up to 8Mb (RISC Developments and Atomwide, for example). If you think 8Mb sounds a lot, don't believe it. Like most things, the more you have the more you want.

## HARD DISC UPGRADES

Increasingly, computer systems are being purchased with a hard disc built in from the start, and rapidly falling prices has resulted in bigger and bigger capacity drives being fitted. Our office Econet system, currently being replaced by Ethernet, has a 20Mb hard disc as a file server. That seemed more than adequate many years ago when this network was installed. Now, all our Archimedes systems individually have hard drives of 40Mb or more, and we not infrequently run out of space.

A hard disc drive not only offers better and more convenient storage for your files and applications, like memory it can also improve speed of operation. Outline fonts can be accessed much more quickly from a hard disc, as can records in a data file, and so on. If you are in the market for a hard disc, then I suggest you think of a number and then double it. If you think 20Mb is enough, go for 40Mb, if 40Mb then go for 80Mb - you won't regret it and it is cheaper than replacing one hard disc with another of larger capacity later, or suffering the inconvenience of having two hard drives (though there are circumstances where this can be an advantage - for example, by having an external hard drive which can be moved between home and work).

As far as choice is concerned, there are many companies offering suitable drives (RISC Developments, ICS, Cumana and many more). You also have to decide what type of interface to go for, usually a choice between SCSI and IDE. A SCSI interface is faster, is an industry standard, and one interface has the capability to handle up to seven devices. So if you are likely to want to fit other devices which also need a SCSI interface, scanners for example, this may be a better choice in the longer term. If you are unlikely to indulge in other expansion cards, or if immediate cost is more important, then an IDE drive would probably be the better bet.

Don't forget that different drives also operate at different speeds. If you are likely to require frequent access to large files (large sprites, for example, or data files, etc.) then check on the transfer rates (usually measured in kilobytes per sec.) and go for a higher speed drive. Again that may put the price up, though the larger the capacity of a drive, the quicker the access time is likely to be.

Of course, there are many other technical details with regard to disc drives, and we are really only skating over the surface here. What I am trying to do is to offer some general advice as a user myself.

## PRINTERS

While memory and hard drives are often part of your original system, a printer is always separate, and there is a wide choice available. At one time, the only choice for a reasonably priced machine was a dot-matrix printer, other types of printer technology have become increasingly competitive and often provide superior quality.

You will have to decide whether black and white printing is sufficient or whether you will need colour. In my view, high quality colour is difficult to achieve cheaply, though see last month's review of the Star SJ-144 printer. And while dot matrix printers are available with multi-coloured striped ribbons, I feel that their output is often disappointing. Some colour printers also produce somewhat degraded results when attempting to print in monochrome only, and seldom provide the crispness and depth of black which a good mono printer can achieve.

For black and white printing you have the widest choice. I certainly like Canon's range of bubble jet printers (the BJ10ex and the BJ200/230). They are reasonably fast, pleasantly quiet, with excellent quality of output, and I for one would thoroughly recommend them. However, do check on costs of new ribbons, ink cartridges, or whatever, or this may come as a nasty shock later. The more 'black' you print per page, the quicker the ribbon or cartridge will need replacing.

When choosing a printer it is as well to ignore the many built-in features with which the salesman will regale you. With so much text output now using outline fonts, you will be using your printer in 'graphics' mode most of the time, so it is the speed and quality of graphics printing which really counts. I should also mention printer drivers. While those supplied with the Archimedes are mostly adequate, Computer Concepts' Turbo Drivers do have the advantage of releasing your system very quickly, so that you can continue to use your computer, while printing takes place. I know we all thought that RISC OS 3 would do this for us, but unfortunately this has not proved to be the case in practice.

For the more affluent user, where the highest quality is important, laser printers (or PostScript laser printers) represent the best. And while output at 300dpi (dots per inch) has been commonplace until now, higher resolutions are beginning to emerge. While laser printers are quite expensive, direct drive laser printers, like Computer Concepts' Laser Direct, and Calligraph's equivalent, provide a cheaper solution. The latest development here is Calligraph's 1200 dpi printer, which promises to offer superb quality.

## OTHER UPGRADES AND CONSIDERATIONS

If you have already bought one of the smaller machines, like the A3000 or the more recent A3010, A3020 or A4000, then internal expansion capability is relatively limited. HCCS's Ultimate Micro-podule system is one partial solution, but does leave you somewhat dependent on HCCS for all your interfaces. If you are one of those users who wants to hook scanners, digitisers, graphics cards and more onto their machine, an A5000 or one of the older A400/1 series is probably a better bet.

**Canon BJ-200**

The other alternative is to fit an external expansion box to a smaller system, so that standard size cards can be fitted with this box. It works but to me seems a messy arrangement.

Finally, let us just dwell briefly on the merits of fitting an ARM3 processor or a Floating Point Accelerator. The former can have quite a noticeable effect on performance, particularly with things like screen refresh speed. If you do a lot of document processing, including pictures, then an ARM3 can avoid potential frustration, and improve your rate of working (but do note that an ARM3 cannot be fitted to the newer A3010, A3020 or A4000 models).

Unlike the ARM3, the FPA is a much more specialised beast (see review in RISC User 6:9), and will mostly benefit high volume mathematical applications, such as spreadsheets and CAD packages. The FPA is also compatible only with ARM3 based systems, the A5000 and those fitted with a proprietory ARM3 processor with a suitable socket, so you don't choose between one or the other - you must have an ARM3 machine before the FPA is even a possibility.

***We expect to give more detailed analysis of some upgrade routes in future issues of RISC User.***

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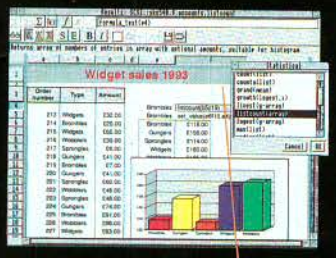
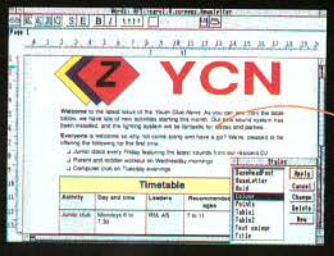



# wordz

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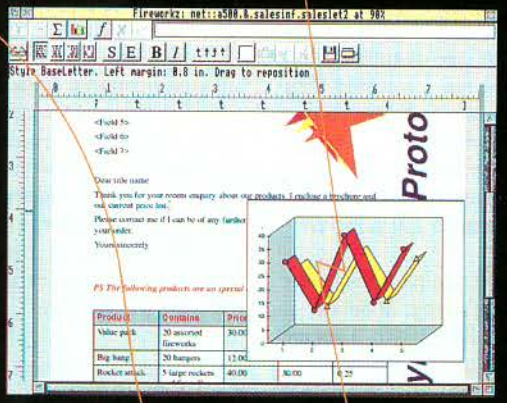


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# Explore with Flossy the Frog

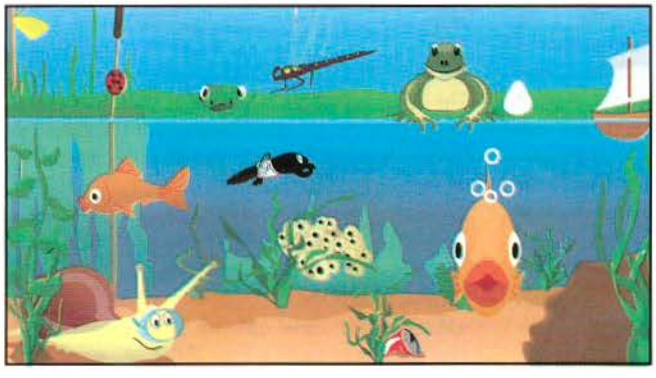
*Mark Sealey explores 4Mation's latest graphical adventure game*

Flossy the Frog, an adventure game for primary school aged children, is a little different from 4Mation's products that have been reviewed in RISC User of late. The on-screen presentation of Flossy the Frog is in some ways similar to that of Noot or Granny's Garden. Yet Flossy is, if anything, even more open-ended than these programs. Children have considerably more to do than simply complete tasks, and are left to explore the world in which Flossy lives at will.

## WHO IS FLOSSY?

Flossy is a frog. With her, you explore a variety of environments, some of which are very frog-like, e.g. the country, and others much less so, e.g. in space. There is a total of nine main locations, with each scene containing a wide variety of objects that can be examined, turned on and off, opened, closed, pressed, pushed, etc. Beneath the graphic for each location (figure 1) is a short description of what is happening in the scene, what is about to happen, or a suggestion to look our for someone or something. All actions are controlled with the mouse - click on almost any object, and something strange and exciting is bound to happen. The conceptual model is that of a simple interactive video or CD-ROM - very visual, but not as complicated as the labyrinthine adventure games that can so quickly fail to motivate children who are short of patience.

So Flossy's world is full of surprises. This represents intrinsic motivation for children to keep on clicking, just to see what happens. It is a very simple idea, and one which works well if approached thoughtfully.



**Flossy and friends**

This same quality also makes working your way around a scene, once disbelief is suspended, quite enthralling. For instance, who would have thought that tadpoles wore nappies? Similarly, there is a good range of challenges to achieve results - from the obvious clicking on a fridge door to open it, to the much more puzzling prospect of guiding yourself, and Flossy, off a bleak planet, with only a single view of the stars in front of you.

**Flossy the Frog**

The graphics are smooth and compelling, the animations convincing and the characterisations appealing. Watch out for the snake.

Incidentally, the credit for the graphics goes to one Hans Rijnen who lives and works in Amsterdam. It will therefore come as no surprise that a Dutch version of Flossy has been written, and was launched there last October. The connections with Holland have always been positive ones (remember the Big Ben Club?) It is good to see them continuing.

## IN USE

Once the copy-protected disc, which must always be in drive 0 while the program is being used, has been initialised, the scenes unfold in whatever order you make them. They seem to be randomly arranged and can be visited in almost any order. In

fact, there is a clear set of paths through the program. Certain actions and activities require others to have been completed before anything productive can happen. For example, a specific sequence of clicks is required to move from the bedroom, say, back to the beach. Again, the teacher should be prepared for this in deciding how to use the package, and thus to plan sessions so as to draw out some of the learning points which the product is capable of sponsoring (see below).

It is worth noting that the scenes and animations can take a few seconds to load from each of the three discs comprising the package, and that the suite requires a minimum of 2Mb. Thus there is a distinct advantage in running Flossy from a hard disc on an expanded machine.

When running Flossy from 3.5" discs, the prompts to insert the required disc are, unfortunately, in the standard ADFS message window. This is rather out of keeping with the visual appeal of the rest of the suite.

In common with, say, Darryl, Noot (see RISC User 6:4) and other titles recently released by 4Mation, there is ample control over font usage for screen prompts, sound volume and whether the program temporarily takes over the Desktop or multi-tasks, etc.

## WHAT IT TEACHES

This imaginative little package can be used to promote more learning activities than you might at first think. Some approaches are set out in brief in the booklet.

**PRODUCT INFO**

| | |
|---|---|
| *Product* | *Explore with Flossy the Frog* |
| *Supplier* | *4Mation*<br>*14 Castle Park Road,*<br>*Barnstaple,*<br>*Devon EX32 8PA.*<br>*Tel. 0271 25353*<br>*Fax 0271 22974* |
| *Price* | *£31.00 inc. VAT*<br>*£57.33 inc. VAT (site licence)* |

For many young users, manipulating the mouse in a purposeful way will be a very valid activity in itself, contributing not only towards greater familiarity with the Desktop and how to use it properly, but also towards more general manual dexterity.

Skills of memory will almost inevitably be developed by having to recall exact locations within each separate graphic. So will the associated use of logic and understanding of sequence in moving about Flossy's wider world in the desired order - having to wait for the star to stop flashing before clicking in just the right spot to move on.

With these come the more abstract skills of making and testing hypotheses: what will happen if this time we let Flossy get swept away by the flood?, etc.

Flossy's rich stock of experiences, albeit vicarious ones, gives much scope for language development: the exact phrases to describe the positioning of objects... the lily is just behind the tree, but its left-hand leaf is in front of it. This sort of language, of course, is intimately linked with the development of the pupils' spatial awareness, and appreciation of relative sizes and shapes of things and what will and will not fit where. If Flossy herself were more vocal in her feedback, more still could be made of the child's interaction with her world.

The novelty and child-centred environment in which Flossy does her stuff should provide ample scope for stories, poems and drama. The theme of exploration will give opportunities to talk about safety with unfamiliar, and familiar, objects in the world around us.

Through Flossy's world, young children could also be introduced to environmental issues - waste and plenty, caring for our world and appreciating the many different geographical features through which she passes.

The exploration, too, of basic scientific notions can be tackled. Themes such as clocks, water, life-cycles and floating and sinking, are all central to the Science National Curriculum. As an accessory to practical work in the classroom, Flossy the Frog could be used quite profitably here.

## WHO'S FLOSSY FOR?

The short, but wholly adequate, booklet that comes with Flossy claims, quite rightly, that the suite will 'delight users of any age,' thanks to its animation and surprises. Absolutely! Primarily, though, Flossy is designed to be used with children of up to eight years old.

## CONCLUSION

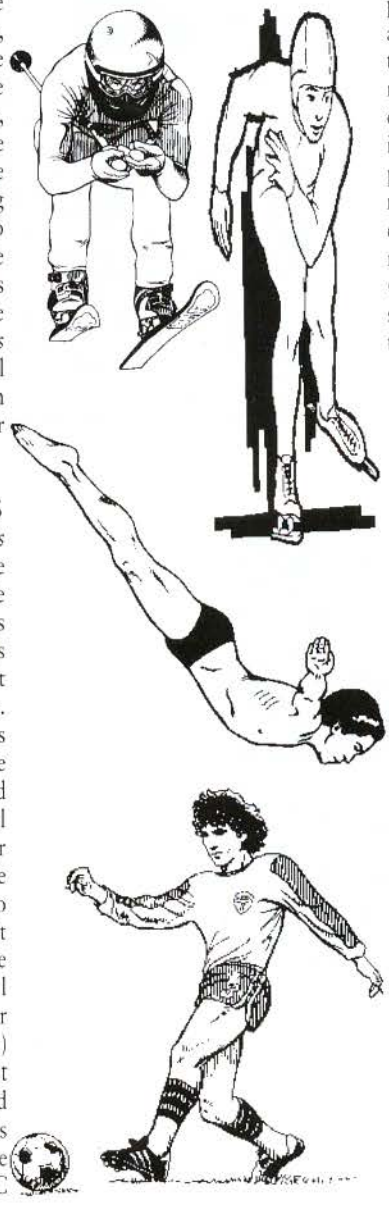
4Mation have come up with another winner. If you want something a little different, which will provide scope for purposeful activities to build the confidence of pupils at Key Stages 1 and 2, will not be over-prescriptive, and can profitably be used in many areas of the National Curriculum, then you should not turn your back on Flossy. Anyway, you can never predict what she will be up to if you do!

# The PC Emulator Survival Guide (Part 9)

*Gordon Gilmore examines the pitfalls and problems involved in converting foreign graphic formats into Archimedes sprites.*

If, like me, you followed the series of articles on *Working with Images*, and then dashed out to buy a load of shareware discs full of clip art, you may have experienced problems converting certain types of images with *ChangeFSI*. For example, the sporting pictures shown down the centre of this page are, as far as *ChangeFSI* is concerned, rectangles of pure unadulterated black! More of that later. In this part of the 'guide' we are going to look in a little more detail at transferring PC images to the Arc - and back again, and examine a couple of small utility programs.

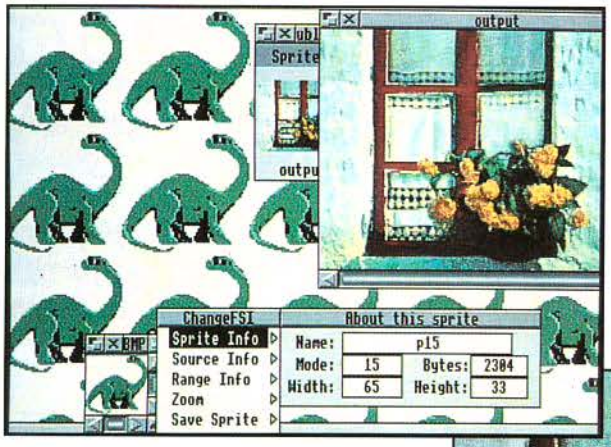
For converting files we are going to use, as far as possible, *ChangeFSI* rather than the alternative *Translator*. There are two reasons. Firstly it is free, and secondly, as Lee found, the results for colour images are often more satisfactory using *ChangeFSI*. For those who might like to follow the article at the keyboard, all the files referred to are provided on the magazine disc in the *PCFiles* application directory. You will need to load *ChangeFSI* from your RISC OS 3 Support disc or wherever.



**BMP (BitMap Picture) FILES**

BMP files are used by *Windows* to create 'wallpaper' - what we would call a backdrop. We could take any of the .BMP files from our PC Windows directory and simple drop it onto the *ChangeFSI* icon. Rather than use a Windows BMP file I have jumped on the Jurassic Park bandwagon and have created a 65 by 65 pixel bitmap of a dinosaur (*DINO/BMP* on the magazine disc.) Dropping this onto *ChangeFSI* using the default options with the screen mode set to 15 results in a small window with a green dinosaur in it. (As in the first screenshot.) So far so good. If we look at the sprite information we find that the sprite is 65 by 33 pixels instead of 65 by 65 as we expected. This is because PC pixels are square (or at least are assumed to be square) whilst the Arc pixels in mode 15 are rectangular. This means that on the Y axis each sprite pixel is derived from two BMP pixels. This would inevitably mean a loss of detail from a detailed image. We can get round this by using the *ChangeFSI* scaling function to set up a custom 2:1 scaling on the Y axis so that each BMP pixel is mapped to a sprite pixel. That would then leave us with a stretched sprite and to compensate we have to scale the X axis by 2:1 as well. The result is a square mode 15 sprite 130 by 65 pixels. (This is what I have used as a tiled backdrop for the first screenshot.)

The disadvantage of scaling like this is that the sprite file ends up twice as large as the original BMP file. Fortunately the Arc is very clever at manipulating sprites to suit the current display mode and an alternative is to convert the sprite to a square pixel sprite. This is accomplished by resetting the scaling to 1:1 and selecting an 8 bit square pixel option in the *ChangeFSI Output* dialogue box. *ChangeFSI* will then insert 28 into the Mode box. Re-processing the image then provides a 65 by 65 pixel mode 28 sprite.




**A BMP converted to a sprite by *!ChangeFSI* and used as a tiled backdrop**

You may have noticed that we have not worried so far about how many colours the image was expected to contain. As it happens, BMP images can be 1, 4, 8 or even 24 bit colour - that is 2, 16, 256 and 16 million colours. There is no way of knowing how many any particular image holds without loading it into *ChangeFSI* or some other program. As is happens *DINO/BMP* was an 8 bit image (eminently suitable for a mode 15 backdrop) and this can be confirmed by examining the *Source Info* on the menu you get if you click over the transformed image.

to 24 bit colour. As before, the only way to find out which is to load the file into *ChangeFSI* and examine the *Source Info*. If you were to do this with the *MAP/PCX* file on the magazine disc, which was exported from Borland's *Quattro-Pro* spreadsheet running under the Emulator, you would find that it is a 4 bit (i.e. 16 colours) image. At first sight it would not be unreasonable to create a 4 bit sprite in mode 12 (rectangular pixels) or mode 27 (square). The result is disappointing. In the first place the colour is

**An Archimedes Sprite converted to BMP format and used as *Windows* wallpaper**

**EARTH/PCX displayed by PICEM using the PC emulator**

## PCX IMAGES

All that we have covered so far holds for PCX files, which can be handled by *ChangeFSI* quite successfully, as explained in *Working with Images* Parts 1 and 3. However the *Ignore source pixel size* option must be selected in the *Scaling* dialogue box. As with BMP files, PCX images can hold up

nothing at all like the original. This is because *ChangeFSI* adheres to Acorn's principle that all multi-tasking applications should use the standard desktop palette, and tries to match the PCX colours by dithering the available desktop colours (of which 8 are grey shades remember). The result is a disaster. In fact 1 and 4 bit PCX files may or may not contain a palette, but even though the sprite saved by *ChangeFSI* contains a palette it is the desktop palette not the source file palette. The second problem is that because of the dithering, broad areas of colour look messy. This can be corrected by selecting *Disable dithering* in the *ChangeFSI/ Processing* dialogue box. The result is a clear - but totally incorrect - colour. The colour match is much closer if you create a 256 colour (8 bit) sprite because there are many more colours available to attempt to match the source colours. The resulting sprite will be four times bigger, of course. You will in any case find your sprites much bigger than the original PCX file because PCX images are compressed.

*Translator* does actually use the source palette and save it with the sprite. This means that 16

colour PCX files are much better translated than is possible with *ChangeFSI*.

When we come to two-colour PCX files things get more complicated. The *SOCCER/PCX* file on the magazine disc, which holds the black and white picture of the footballer on the previous page, comes from a collection of sporting clip art. Using *ChangeFSI* to convert any of the files on that disc results in a completely featureless black rectangle. The problem seems to be that there are different versions of the PCX file format, versions 0, 2, 3 and 5. *ChangeFSI* will only handle version 5 images. (If you think that's daft, the latest version of *Windows 3.1 Paintbrush*, will handle versions 2 and 3 but not version 5 - unless it's in colour.) *Translator* has no trouble with any version, and if you want to be sure of reading all PCX files you will have to invest in the PDX9 shareware disc.

The file *WFALL/PCX* on the magazine disc is a black and white version 5 image produced by Steven Hornback which *ChangeFSI* will load, but you will need to set the *Processing/Invert input* option. Even with *Translator*, matters are not straightforward for version 5 files, and you may need to switch off the *Auto palette* and *Add palette* options to get a sensible sprite.

### GIF (Graphics Interchange Format) FILES

These are pretty straightforward, taking into account the advice already given for PCX files. Again it is better to use 256 colour modes for all colour images, and a good example of this is provided on the magazine disc. The 16 colour image in *EARTH/GIF* is quite breathtaking in screen mode 15, though rather dull and dowdy in mode 12. Again the sprite you end up with will be huge because the data in the GIF file is compressed to 62% of its full size.

### DOS UTILITIES FOR IMAGE DISPLAY

One problem with BMP, GIF and PCX files is that you cannot know in advance what sort of image they hold. There is a neat little DOS utility called *GIFDIR* which will add onto the end of a normal directory list, information about any GIF files it finds. The program is used as a pipelined command such as DIR *.* | GIFDIR from which the response might be:

```
DINO      BMP      5498   9-26-93   1:17
EARTH     GIF     50176   8-17-92  12:05p [640x400x16]
FLOWER    GIF     60288   4-24-90  10:51p [640x350x16]
GULLS     GIF     43008   7-05-88  10:48a [320x200x256]
SUB       PCX     40230   9-19-90   1:30p
     10 File(s)     204800 bytes free
```

If you would like to see what your GIF and PCX files should look like before you give them to *ChangeFSI* to work on, then *PICEM* might help. The DOS instruction

```
PICEM /V:L *.GIF
```

will display each GIF file in the current directory using a VGA screen mode selected by the */V:L* switch. There is little point in trying to use the Emulator for displaying GIF and PCX files in anything other than the VGA mode. *PICEM* works fine for 16 and 256 colour GIFs but is a little pernickety about PCX files, especially version 5s. Unless the appropriate screen mode is selected the colour rendering may be odd. The following are useful variations:

**/V:C for a 640#200#2 colour CGA mode**
**/V:D for a 640#200#16 colour EGA mode**
**/V:L for a 320#200#256 colour VGA mode**

There are many shareware image handling programs and utilities advertised, but many of these will not work under the emulator because they specifically look for an EGA or VGA hardware card. A particular example is *Neopaint*, a very good DOS based *Paint* type program which will not run under the Emulator. If anybody does know of suitable programs, let me know and I will pass the message on.

### TRANSFERRING IMAGES TO THE PC

To transfer a sprite image to a DOS readable format you will need a copy of *Creator* (on the PDX9 disc). Simply dropping a sprite onto the program's icon will convert it to a GIF format which can be read by a number of DOS and Windows programs. As an exercise I decided that my PC running under Windows would look better with a picture of a window as a backdrop. Taking the mode 15 picture shown in the *Paint* window in the first screenshot, I first scaled it to 640 by 480 to fit the Windows backdrop size before converting it to a GIF file. A disc copy of this was then read into a shareware program called *PaintShop Pro* on my PC, which can perform a wide range of image conversions, and re-saved as a BMP file in the Windows directory. A bit of reorganisation using of the Windows set-up allowed me to specify the new image as 'wallpaper', and the result was as you see in figure 3, where you can also see our original dinosaur bitmap loaded into *PaintShop Pro*. The circle is complete.

**All the GIF images, most of the PCX images and the utilities discussed in the article and provided on the magazine disk were obtained on shareware discs from:**
Kingsway Computer Services,
72 Glencoe Road,
Sheffield, S2 2SR.
Tel. 0742 750623

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Extra discs cost £69 +VAT (£81 inclusive) each.

# Norwich Computer Services

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# Wimp Topics - Interactive Help

*Alan Wrigley explores the techniques of providing interactive help in your own programs, based on an idea by Kate Crennell.*

You may have noticed an application called Help on one of your Applications discs if you have RISC OS 2, or in the Apps directory in ROM if you have RISC OS 3. This is designed to interact with other applications on the Desktop to provide interactive help for the benefit of the inexperienced user. Acorn is very keen that software developers should make use of this, since it can often encourage beginners to feel at home with their computer and the software they are running in a much shorter space of time than would otherwise be the case. It is not difficult to implement interactive help in your programs, and such help can be entirely context-sensitive; in other words, wherever the user positions the pointer, you can arrange for a help message to be displayed, showing the purpose of the window area or icon under the pointer.

To see the kind of effect that can be achieved, run the Help application alongside another application that interacts with it, for example Edit (in RISC OS 3, both these applications can be found by clicking on the *Apps* icon on the icon bar). A long thin window will open near the bottom of the screen, and this is where the help messages will appear. If the pointer is over a window belonging to an application which interacts with Help, the window will contain helpful information about what is under the pointer. Figure 1 shows Help in action.

Using Edit as our example, open a document window and then move the pointer over it. You will see that the Help window displays three lines of information:

```
Click SELECT to set the caret.
Drag SELECT to set a selection.
Click ADJUST to set a selection.
```

Now move the pointer over the title bar, the scroll bars and the window frame icons. The text in the Help window will change to indicate the purpose of the window area currently under the pointer. If you click Menu over the document window and then highlight any of the menu options by moving the pointer over them, the help text will give you information about the effect of choosing that menu option.

## GENERATING INTERACTIVE HELP

It is really very simple indeed to interact with Help to provide the messages to be displayed in its window. The interaction is conducted through the Wimp messaging system. Every tenth of a second the Help application sends a message to the owner of the window and/or icon under the pointer, giving the handles together with the current pointer coordinates, and the task just replies to this by quoting a text message to be displayed. That is literally all there is to it.

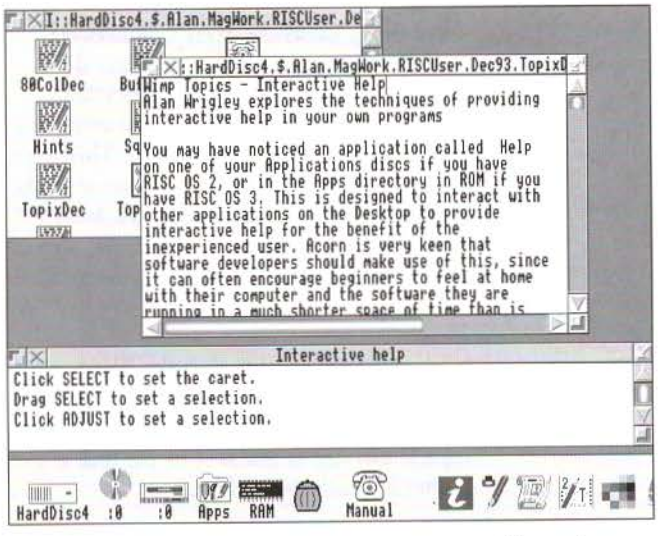
I::HardDisc4.$.Alan.MagWork.RISCUser.De
88ColDec
Hints
TopixDec
I::HardDisc4.$.Alan.MagWork.RISCUser.Dec93.TopixD
Wimp Topics - Interactive Help
Alan Wrigley explores the techniques of providing interactive help in your own programs
You may have noticed an application called Help on one of your Applications discs if you have RISC OS 2, or in the Apps directory in ROM if you have RISC OS 3. This is designed to interact with other applications on the Desktop to provide interactive help for the benefit of the inexperienced user. Acorn is very keen that software developers should make use of this, since it can often encourage beginners to feel at home with their computer and the software they are
Interactive help
Click SELECT to set the caret.
Drag SELECT to set a selection.
Click ADJUST to set a selection.
HardDisc4
Apps
RAM
Manual

**Figure 1. Exploring Interactive Help**

Of course, your program needs to be written with this process in mind. Each window, part of a window, or icon on which you wish to provide help must be individually identified when the help request is received, and there must be a corresponding text string somewhere that your task can send back with its reply. We will look at ways of handling this later, but first we will describe the message protocol. The message sent by Help is action code &502 *(Message_HelpRequest)*, and its parameters are as follows:

```
block+16        &502
block+20        mouse x coordinate
block+24        mouse y coordinate
block+28        mouse button state
block+32        window handle
block+36        icon handle
```

block+0 to block+12 are filled in as for any other Wimp message.

As you can see, the information is identical to, and in the same order as, the data returned by a *Mouse_Click* event, or by "Wimp_GetPointerInfo". If you merely want to display a help message which relates to the window or icon in question, all you need to do is read the appropriate handle and send the corresponding text string. If the help message depends on which part of the window is involved, you will need to use the coordinates given (which are of course screen coordinates), and translate them into work area coordinates. This can be done immediately after receiving message &502, as follows:

```
SYS "Wimp_GetWindowState",,block%+32
wx%=block%!20-(block%!36-block%!52)
wy%=block%!24-(block%!48-block%!56)
```

The work area x and y coordinates of the pointer are now in *wx%* and *wy%*. This call conveniently makes use of the fact that the window handle is already in block+32, but it will overwrite the icon handle in block+36, so you must preserve this first if you will need to use it later.

It is important to note that the Wimp itself provides the help messages for the window frame areas - the title bar, scroll bars etc. - so a help request message is *not* sent to the task if the pointer is outside the work area.

Having determined the text message that you want to be displayed, you now send back message action code &503 *(Message_HelpReply)* as follows:

```
block+0         length of message block
block+12        your_ref (i.e. block+8
                  from previous message)
block+16        &503
block+20        help message
```

The text may contain any printable characters, including top-bit-set ones. If a line is too long for the window, Help will wordwrap it, but you can also force a new line at any point by including the sequence "|M" in the string. The PRM states that the string should be null-terminated, but in fact it will work if terminated by a carriage return (ASCII 13) or a linefeed (10) instead. Since a message block cannot be more than 256 bytes in total, the maximum length of the help message is 236 bytes including the terminator.

For many applications, simple help is all that is needed. For example, a window containing a few action icons would need a couple of lines for each icon describing what happens if that icon is selected. The text for these help messages could be held in a string array, and the appropriate element of the array placed in *block+20* before returning the help reply message. Alternatively, it could just be stored directly in the block at the time of dealing with the help request, as follows:

```
ihandle%=block+36
help$="Clicking on this icon enables you to "
CASE ihandle% OF
WHEN 0:$(block%+20)=help$+"change the
width"
WHEN 1:$(block%+20)=help$+"erase your
drawing"
.......
```

and so on. If the user no longer wishes to receive help, the Help application can just be removed from the icon bar and the whole process will go into hibernation.

## COMPLEX HELP

For more complex applications, however, the use of interactive help implies a significant overhead in terms of memory space required to store all the help messages. There is another disadvantage too, and that is that it slows down the operation of the computer to some extent - quite logical really, when you consider that every tenth of a second everything has to pause while Help holds a conversation with another application and displays the result. For this reason, many commercial applications offer the user the choice of starting up with or without the help facility. This enables users to take advantage of interactive help while they are learning, and to dispense with it when they are satisfied that they know their way around the software. If your application offers anything more than very simple help, you should consider this approach. You could implement it by offering a choice

from the icon bar menu of help or no help, and allow the user to save the current status so that it becomes the default in future. If help is chosen, you could load a text file into memory, perhaps using tokens to identify individual messages just as MessageTrans does, and then read the appropriate message at the time of sending a help reply.

## A PRACTICAL EXAMPLE

To round off this month's article, here is a routine to implement help messages for a save box, whose window handle is held in *savehan%*. It is assumed that the file icon has a handle of 0, the writable icon containing the pathname is 1, and the *OK* action icon is 2. In your initialisation procedure you could set up help strings as follows:

```
DIM help$(3)
help$(0)="Drag this icon to a directory viewer
to save the file"
help$(1)="This icon contains the filename"
help$(2)="Click on this icon to save the file|M
provided that a full pathname has been given"
help$(3)="This is a standard RISC OS save box"
```

The procedure which receives messages would then contain the following section of code:

```
CASE block%!16 OF
 WHEN ....          :REM other action codes here
 WHEN ....
 WHEN &502:IF block%!32=savehan% THEN
  ic%=block%!36
  CASE ic% OF
   WHEN 0,1,2:$(block%+20)=help$(ic%)
   OTHERWISE:$(block%+20)=help$(3)
  ENDCASE
  !block%=256:block%!12=block%!8:
block% !16=&503
  SYS "Wimp_SendMessage",17,block%,bloc k%!4
 ENDIF
ENDCASE
```

If you wish to provide help on other windows as well, you can replace the *IF....ENDIF* structure with a CASE structure with a separate WHEN statement for each window handle.

This month's magazine disc contains an application called *HelpDemo* which demonstrates the techniques involved in providing interactive help.


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# HINTS & TIPS

*Keep sending in your hints on anything relevant to the Archimedes range. And remember, we pay for every hint we publish.*

## USING 1st Word Plus WITH RISC OS 3.1

**M. Humphries**

The original version of *1st Word Plus* appears not to work under RISC OS 3.1, resulting in menus opening in unreadable colours. A simple modification to its !Run file solves this problem, by loading a suitable palette, and restoring the Desktop palette on exit.

Firstly, save the default Desktop palette (using the Save option from the palette on the icon bar) into the *1st Word Plus* directory with the filename *!Palette2*. Next, modify its *!Run* file, adding the line:

```
Run "<FirstWordPlus$Resources>!Palette"
```

before:

```
Run "<FirstWordPlus$Resources>1wp"
```

and:

```
Run "<FirstWordPlus$Resources>!Palette2"
```

after it.

Then resave the edited !Run file.

## USING THE ColourTrans MODULE

**Pieter Schmidt**

The *ColourTrans* module should be used by all applications that need to be mode and palette independent. ColourTrans provides many SWI calls to return or select the actual colour closest to or furthest away from a required palette entry. The palette entry contains the red, green and blue components of the required colour in the following form, expressed in hexadecimal:

```
&BBGGRR00
```

where BB is the blue, GG is the green and RR is the red component.

Calling *SYS "ColourTrans_ReturnGCOL"* with a palette entry returns a GCOL colour that can be used to select the nearest colour. Using this call in 256 colour modes is quite complex as the colour returned by the SWI call must now be divided into GCOL and TINT components,for example:

```
SYS "ColourTrans_ReturnGCOL",PaletteEntry%
TO gcol%
IF NumberOfColours%=256 THEN
    GCOL (gcol%AND&fc)>>2 TINT
(gcol%AND&3)<<6
ELSE
    GCOL 0, gcol%
ENDIF
```

The easiest and most sensible method of choosing colours is to use ColourTrans_SetGCOL. Instead of returning the GCOL value, this SWI actually sets the colour for you, obviating the need for any complex colour selection routines in 256 colour modes. Under RISC OS 3, bit 8 of register R3 specifies whether ECF patterns should be used (and automatically selected) to better approximate colours using dithered patterns. Therefore, to select the closest colour using dithered patterns, use:

```
SYS "ColourTrans_SetGCOL",PaletteEntry%,,,256,0
```

where *PaletteEntry%* is the RGB colour as described previously.

## SPEEDING UP DIVISION IN BASIC

**Alan Wrigley**

Division in assembler is always faster to execute when the divisor is a power of two, since the operation can be performed simply by shifting the bits one or more places to the right. But the same is also true to a lesser extent in Basic, for example:

```
A%=B%>>5
```

will generally execute more quickly than the equivalent:

```
A%=B% DIV 32
```

This can be useful in situations where speed is important, such as redrawing windows for example.

## AUTOMATIC FONT MESSAGE FILE MAKER

**M. Rix**

The *Faster Font Cataloguing* hint in RISC User 7:1 speeds up font installation enormously, but the creation of suitable message files is very tedious.

The following short program will automatically build a font message file. To use it, install the required font directory by double-clicking on it, and run the program listed below. When prompted for the *Output filename*,

enter the pathname of the fonts directory with ".Messages" appended. The program will then save the font list directly into that directory.

```
OSCLI "FontCat { > <Wimp$Scrap> }"
INPUT "Output filename: "OUT$
:
IN = OPENIN "<Wimp$Scrap>"
OUT = OPENOUT OUT$
:
REPEAT
A$=GET$#IN

IF LEFT$(A$,6)="Corpus" OR LEFT$(A$,7) =
"Trinity" OR LEFT$(A$,8)="Homerton" THEN
   BPUT#OUT, "# ";

BPUT#OUT, "Font_" + A$ + ":" + A$
A$=GET$#IN
UNTIL EOF#IN
:
CLOSE #IN: CLOSE #OUT
OSCLI "SetType "+OUT$+" Text"
END
```

## VIEWING HYPERSPACE

**Ken Cowap**

The *Hyperspace* article from RISC User 7:1 mentions an alternative method of viewing the images without the red/green glasses. Another less eye-straining method is to relax the eyes, so that each eye looks straight ahead to infinity. Don't focus on the image, but rather look "through" the screen.

To use this method easily, the images on screen should be no further apart than the eye-to-eye separation of about 2½ inches. Modify the following lines to bring the images closer together (both magazine and disc versions):

```
 1340 ORIGIN 420, 512: PROCrotate(0,3,PI/60):
PROCplot(result(), 3)
 1350 ORIGIN 860, 512: PROCrotate(0,3,-PI/60):
PROCplot(result(), 3)
```

And to complete the change, mode 38 gives a smaller picture than mode 8, so:

```
 100 MODE 12: MODE 38: PROCinit
```

On ARM3 machines, the images move too fast, but instead of switching the cache off, the extra processing speed can be used to give smoother motion. Modify line 1060 to:

```
 1060 OFF: VDU 19,2,2|: angle=PI/72: disp%=1:
d%=800
```

## MENON VIRTUAL DESKTOP

**Alan Bonsor**

The public domain application *Menon* (included in the RISC User PD Software Library on PD50, PDX7 and PDY2) provides a virtual Desktop feature that allows scrolling over a larger Desktop. This feature is incompatible with applications that restrict the mouse bounding box, as *Menon* resets it when scrolling the Desktop. Applications that rely on the mouse staying within a bounding box, and do not expect mouse co-ordinates outside it, may not work correctly.

For example, the *Artworks* HSV Colour Selector restricts mouse movement when clicking within the colour panel. With the virtual Desktop, the mouse is not restricted to this square and the selector does not work correctly.

## USING NewLook WITH OTHER STICK BACKDROPS

**Pieter Schmidt**

Users of various sticky backdrop applications may experience problems with Acorn's *NewLook*, due to the fact that it uses the command **Backdrop*. Most pinboard alternatives do not currently support this command, so the *NewLook* application will report the error *File backdrop not found* when run.

To allow the automatic selection of high or low resolution icons on such pinboard applications, without the backdrop texture feature, the *NewLook* application can be modified by removing (or commenting out) all lines containing the word 'backdrop'. The files *!RunImage* and *RTexture* must be modified accordingly.

## ICONISING NewLook

**Pieter Schmidt**

Acorn's *NewLook* application automatically selects between high and low resolution icons during mode changes, if it is left running over the mode change. *NewLook* does not install itself on the icon bar but throws up a dialogue box which can get in the way since it must be left open.

One solution to this problem is to modify the *NewLook* Templates file so that the dialogue box includes a *Close* icon. Then, closing the dialogue box with Shift held down will iconise it so that it's out of the way, but stays running.

## CHANGES TO DEVICE DIRECTORY NAMES

**Brian Horder**

The method used to open the null system device for use as a waste bin on RISC OS 2:

```
*Filer_OpenDir null:
```

cannot be used on RISC OS 3. The RISC OS 3 Filer assumes all directory viewers view a directory, not a device, and therefore attempts to prefix the filename with a '.'. Any attempt to move a file to this Filer window generates an error of the form "Error when writing null:.filename".

To correctly open a directory viewer for a system device, the root directory name, $, must be included. Thus:

```
*Filer_OpenDir null:$
```

is the correct method of opening the null device on RISC OS 3.

## ACORN'S PRISONERS?

**Graham McKillop**

Someone at Acorn must have a strange sense of humour. Take a look at the template 'power' in the *Resources:$.Resources.Switcher.Templates* file using FormEd.

## RISC OS 3 PRMS - A HARDWARE UPGRADE

**John West**

The volumes of the RISC OS 3 Programmer's Reference Manuals are quite difficult to extract from their box. A piece of wood about an inch square and 6.5 inches long placed at the back of the box stops the volumes going right in, and makes them much easier to get out!

## MASTERFILE 3 FILE INFORMATION

**Alan Bonsor**

The File Info dialogue box on Masterfile 3 can appear to give incorrect file size information when a database is open. The information given is actually the total disc space taken by the database†in its current state, including all cards, reports, subsets and indices, and not the size of the data file as such.

As a consequence, adding just a few records to a database can sometimes appear to increase the size of the database enormously, as some of the subsidiary files are updated at the same time. To obtain more precise information on file size, open the application directory containing your database, and examine the data file using Filer's *Count* option.

## SPEEDING UP RISC OS 3 VERIFY OPERATIONS

**Martyn Fox**

Verifying floppy discs from within the Desktop on RISC OS 3 can be useful if other tasks are being performed, but can seem very slow when waiting for the operation to be completed. Moving the *Verify* window off-screen, so that the green progress bar is no longer visible, usually doubles the speed of this operation.

To achieve full speed floppy disc verification, access the command line by pressing F12 and type:

```
*ADFS
*VERIFY 0
```

## STEREO POSITION

**Lee Calcraft**

The **ChannelVoice* command van be used to assign voices to channels in the format:

```
*ChannelVoice <channel> <voice-number or name>
```

where <channel> is in the range 1 to 8, and <voice-number or voice-name> can be found by using *Voices. However, this also changes the stereo position assigned to the channel. The stereo position must therefore be reset after reassigning voices to channels as follows:

```
*Stereo <channel> <stereo-position>
```

where <stereo-position> is in the range -127 (left) to 127 (right), or 0 for centre.

## REDUCING THE VOLUME

**Lee Calcraft**

A simple way to reduce the volume of sound in games like Moric is simply to perform the following command in Basic before running the game:

```
VOICES 2
```

It is a feature of Acorn's sound system that the more voices you use, the quieter the sound is. This could be a one-line program which be placed on your backdrop, or you could include the line at the start of a game written in Basic. To restore full sound, use:

```
VOICES 1
```

## RECEIVING WIMP MESSAGE ACKNOWLEDGEMENTS

**Alan Wrigley**

If a Wimp message is sent with reason code 18 (User_Message_Recorded), then if it is not acknowledged it will be returned to the sender with reason code 19 (User_Message_Acknowledge). However, under RISC OS 3, if you have not included the message action code number in the list which is passed to "Wimp_Initialise" in R3, then it will not be returned. You must ensure, therefore, that your messages list includes not only messages you wish to receive, but also messages you send, if you might wish to take action if they are not acknowledged.

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# Good Impressions

*David Symes shows you how to create borders for use with Impression Junior.*

Unlike *Impression* which allows new borders to be created and imported, *Impression Junior* only allows the use of the 10 pre-defined borders supplied with it. This article will illustrate how, with the assistance of the application *Draw*, it is possible to create and import your own borders into *Junior*.

The technique is really intended for page sized borders, although the method is still applicable for creating the smaller borders used around titles and illustrations.

## PREPARATION

Measure your *Junior* template frame, its width and depth, and calculate the X to Y ratio of your frame. e.g. if the frame width (X) is 150mm and the depth (Y) is 300mm, the ratio is 1:2. The border in Draw can be created at half size so it's more manageable, as long as the size ratio is the same as your *Junior* border. e.g. width 75mm depth 150mm.

## CONFIGURING DRAW

Load *Draw* and open an empty *Draw* window by clicking the icon. Using the *Misc, Paper limits* sub-menu, select *Portrait* and *A4*. Use the *Grid* sub-menu to select *Show, Lock* and the *cm* options. On the *Grid, cm* sub-menu, select the *1 x 10* spacing.

## CREATING THE BORDER

For clarity and ease of description the draw tools will be referred to by numbers, starting at the top with number 1 and so-on down to number 9, the select arrow. Choose tool number 2 and mark out a rectangle the size or ratio required to match your Junior frame, single clicking to fix each corner. Do not double-click to close the rectangle when returning to the point of origin, use a single-click. Click on the move tool number 5. Move the pointer to a new position a few millimetres inside the first rectangle and create a second rectangle, this time double-clicking to close the path.

You should now have a picture frame type object

with a hole in it (figure 1). Of course, if you want your border to have radius corners then use tool number 3.

N.B. Do not use the rectangle tool number 7 to create the border. It will not create the picture frame object required.

Using tool number 9, Select the external object, and from the *Style* sub-menu follow the *Fill colour* sub-menu. Choose the colour you require and OK it, remembering that unless you have a colour printer, white or very light grey is preferable. You should now have a border frame template in your preferred colour with a hole in it (figure 2). Save this under some appropriate name such as *BorderTemp*.

Using tool number 1 to draw a couple of lines around the inside of the frame will give the appearance of a moulded picture frame (figure 3). There is no limit to what can be drawn in the frame (figure 4). When the decorative additions are complete, save it for use in *Junior*.

## USING THE TEMPLATE BORDER AS A GUIDE ONLY

Of course you do not have to keep the template border as part of the finished design. Just use it as a size guide for laying out and sizing the decorations. When the decoration is complete, select the border object (multiple clicks may be required if the border object is hidden by the decoration) and delete it using the *Delete* option on the *Select* sub-menu (figure 4a).

## IMPORTING INTO IMPRESSION JUNIOR

Load *Junior* and open your usual page template by clicking the icon bar icon. Delete the frame and create a new null frame in its place using the *New frame* option on the *Frame, New Frame* sub-menu. Obviously, if you are creating a multi-page document, the *New repeat frame* option on the *New Frame* sub-menu should be used instead.

Place a second ordinary frame inside the first frame and make its dimensions 15mm less than the first frame on all sides, i.e. 30mm total off each X and Y dimension. This is the writable text area inside the border which can be adjusted to suit your particular page setup.

Activate the outer frame and drop the border graphic into it. If your initial ratio calculations were correct, the border should almost fit the frame, but more importantly, its X to Y ratio should be proportionally correct. Use the *Alter graphic* option on the *Frame* sub-menu to make any fine adjustments. e.g. Switch off *Lock aspect*, click on *Fit to frame*, make any small adjustments to *Scale, Aspect X:Y*, switch on *Lock aspect* and click OK.

One important point to remember: the frame containing the border should be behind the frames that it borders.

In this way you can prepare a complete set of borders on disc ready to be dropped into *Impression Junior* whenever they are required.


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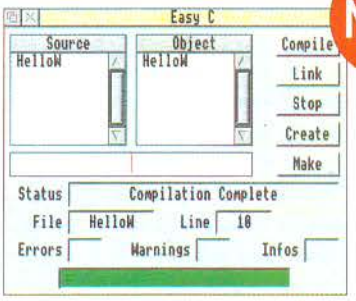


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Easy C uses a WIMP front-end to drive the compiler and linker, so no complicated command-line sequences need to be learnt. C programs may be compiled, linked and run using one single mouse click. It is ideal for beginners, but the full specification ANSI compiler (not validated) allows it to handle very substantial programs.

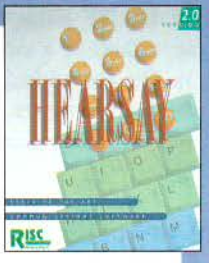
For more advanced programmers, Easy C contains an integrated Make facility and ARM assembler.

Easy C is supplied with a comprehensive user guide including a C language tutorial for beginners and a full description of all ANSI and RISC OS library functions provided.

- Easy-to-use WIMP front-end
- ANSI C compiler generates fast ARM code
- Object code linker for linking programs
- Automatic generation of Make files
- Supports all standard ANSI functions
- Library of basic RISC OS functions
- Integrated ARM assembler
- Facility to create and maintain libraries
- Integrates with editors using 'Throwback'
- FreeWare WIMP library DeskLib supplied

**Easy C £49**

# Hearsay




**Hearsay II is the most powerful general purpose communications package available on Acorn systems.**

This superb package is packed with powerful features, yet remains both easy-to-learn and intuitive to use. Now the latest version has been further enhanced with an improved user interface and 3D-style dialogue boxes throughout.

- VT320, VT102, VT52 and ANSI
- Campus 2000, Viewdata, Minitel
- Tektronix 4107 graphics
- Supports RISC OS printer drivers
- Call logging
- Xmodem, Ymodem, Zmodem, Kermit
- Background file transfers
- Powerful script language
- Number directory with auto logon
- Macro processor & definable keyboard

**Hearsay £75**

*Upgrade from Hearsay version 1, price £35.*

# TypeStudio

**TypeStudio is the complete text manipulation package, ideal for producing high quality adverts, posters, logos, etc.**

Text can be made to flow along lines and curves, or moulded inside shapes. A wide range of special effects give almost limitless design possibilities.

- Flow text along paths
- Mould Draw files to shapes
- Wall, floor, graduated shadows
- 3-D, mirror, slant & plinth
- Save in TypeStudio/Draw file format
- Supports RISC OS printer drivers
- Copy, rotate and magnify
- Import Draw files for moulds

**TypeStudio £45**

*Supplied with 7 fonts and user guide with worked examples.*

RISC developments

**RISC Developments Limited**

117 Hatfield Road, St. Albans, Herts AL1 4JS Tel. (0727) 840303 Fax. (0727) 860263

*Please add £2.70 carriage (£1.70 for TypeStudio) and VAT to prices. Please phone for site licence & educational prices.*

software showcase

# Sleuth OPTICAL CHARACTER RECOGNITION

**Sleuth is an Optical Character Recognition (OCR) package which converts human readable images of text into machine readable form.**

Sleuth processes a scanned image of printed material and converts it into an ASCII file which may be further processed using a text editor or word processor. It is ideal for converting magazine articles, newspaper cuttings, legal documents, program listings, other resource materials etc. etc.

Sleuth version 1.0 is a low-cost entry package into OCR and produces excellent results on a range of typefaces. It is the first in a planned family of products which will take OCR on Acorn machines to full professional level. Any future OCR products will be available as upgrades to existing users.

- Fully RISC OS compliant and multitasking
- Sleuth recognises most PostScript fonts and other similar fonts (not bold or italic)
- With good quality 400 dpi images, Sleuth can achieve over 97% accuracy
- Converts text at speeds of 80-250 wpm
- User definable 'zone' used to choose which rectangle on the image to convert
- Handles sizes 9-24pt (you will need a 400 dpi scanner for good results below 12pt)

*To use Sleuth you will require a scanner with a minimum resolution of 200 dpi. For best results you will need a 300 or 400 dpi scanner.*

**Sleuth £49**

# Masterfile

**Masterfile version 3 is the latest development in this best selling family of database programs.**

Masterfile is fast, easy-to-use and provides powerful data management facilities suitable for home, education and business use.

- Fast, multi-field indexing
- Multiple subsets
- Password protection
- Global calculations
- Multi-line fields
- Database restructure
- Calculation fields
- Import text and pictures
- Export CSV, TSV, ASCII
- Card designer
- Report generator
- Toolbox

**Masterfile £49**

*Supplied with sample databases, user guide, and reference card.*

# Hard Disc Companion

**Hard Disc Companion is the complete backup utility providing excellent security for your valuable data.**

Hard Disc Companion provides a structured approach to the backing up of hard drives to floppy discs, and the recovery of files after disc failure or accidental file deletion. Both Full and Incremental backups are supported, and the files to be backed up or ignored may be specified using simple drag operations.The entire backup specification may be saved in a script file for use at a later date. An efficient compression system backs up data quickly and efficiently.

*'...it is certainly the best hard disc backup utility that I have ever used.' ARCHIVE Apr 92*

**Hard Disc Companion £45**

RISC developments

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# TECHNICAL QUERIES

*More problems solved in this month's Technical Queries.*

**Q** *Dear Sir*
*In your Wimp Topics article on panes (RISC User 6:8), you described a method of attaching a pane to a window. I find that this works correctly except when the main window is toggled from a small to a large size, whereupon the pane stays in the original position and is not redrawn in the correct place in relation to the new position of the main window. Could you please explain why this happens?*

*Colin Murray*

**A** You have highlighted a small problem here which we did not cover in the Wimp Topics article since it would have introduced unnecessary complexity and was not likely to occur very often with the programming example given. The problem is that there are certain circumstances in which a call to "Wimp_GetWindowState", or the parameters returned by an open-window request, can produce a confusing result. If a window is toggled to full size, or there is a mode change, or the *Adjust size* icon is dragged, or "Wimp_SetExtent" is called for a window which is fully on-screen, then the co-ordinates returned will be those *before* the change was made, but with bit 21 of the window flags set. A similar thing will happen, but without bit 21 being set, if a window is re-opened after being closed earlier with part of the visible area outside the screen. The purpose of this is to ensure that none of these actions can cause part of the window to be opened off-screen - in other words, for one call only to "Wimp_OpenWindow", the window must be restricted to the screen area in any of these circumstances.

This means that you cannot always rely on the returned co-ordinates to set the position of a pane. In the example we gave, the window was quite small and could only generate this problem if you changed mode (say from 39 to 20) and the Wimp repositioned the window as a result. What you need to do is to read bit 21 of the window flags when you receive an open-window request. If it is unset, you can proceed as described in the Wimp Topics article. If it is set, however, or if you are opening the window from closed, all you need to do is make an extra call to "Wimp_OpenWindow" before opening the window pair as before. You might have expected that the Wimp would do all this for you since panes are an integral part of the Wimp system, but it doesn't. Luckily it isn't very difficult to implement.

The following modifications should be made to the original listing given in the Wimp Topics article:

```
340 bk%!28=-1:SYS "Wimp_OpenWindow",,bk%
345 PROCopen
372 IF !bk%=main% THEN
374 bk%!128=!bk%
376 SYS "Wimp_GetWindowState",,bk%+128
378 IF bk%!160 AND 1<<21 SYS
"Wimp_OpenWin dow",,bk%
379 ENDIF
```

*Alan Wrigley & Lee Calcraft*

**Q** *Dear Sir*
*Could you please clarify the way in which data typed into a writable icon can be used in calculations to generate a result to be displayed in another icon.*

*R. Brooke*

**A** Writable icons, and any other icons whose contents may change during the execution of the program, must be indirected, since otherwise it is not possible for the contents to be altered. The indirected data is stored in a buffer; if the icon is created from within the program then you will need to set up a buffer and give its address at the time of creation, while if the icon is part of a window created using FormEd, you can find out the address by calling "Wimp_GetIconState". These processes have been documented several times before in RISC User - see in particular *Mastering the Wimp* (RISC User 3:5-3:7), *Technical Queries* (5:5), and the *Wimp Function/Procedure Library* (5:7).

The contents of an indirected text icon are stored in the buffer as a string of ASCII characters, and can therefore be read or written to at any time. For a writable icon, the Wimp puts the characters into the buffer as they are typed. Numeric values will also be stored as ASCII characters, so to make use of a numeric value entered into a writable icon, you must first convert it to a number using the EVAL function. You can then use it in your calculations, and store the result in another icon by converting it back to a string and writing it to the icon's indirected buffer. As an example, suppose that

the user is asked to type a value for length into icon 0 and a value for width into icon 1, and then click on an OK button (icon 2) to display the resulting area in icon 3. Your procedure which handles mouse click events would look something like this:

```
CASE icon% OF
WHEN ....
WHEN 2:!block%=whandle%:block%!4=0
SYS "Wimp_GetIconState",,block%
length%=EVAL($(block%!28))
block%!4=1
SYS "Wimp_GetIconState",,block%
width%=EVAL($(block%!28))
area%=length%*width%
block%!4=3
SYS "Wimp_GetIconState",,block%
$(block%!28)=STR$area%
block%!8=0:block%!12=0
SYS "Wimp_SetIconState",,block%
WHEN ....
ENDCASE
```

In practice, you would also arrange for pressing Return in icon 0 to move the caret into icon 1, and pressing Return in icon 1 to simulate the action of the OK button (see *Technical Queries*, RISC User 6:6, on how to do this under RISC OS 3).

*Alan Wrigley*

**Q** *Dear Sir*
*I am struggling to understand how to use modules but am in danger of being defeated by jargon. For example, what is an "instantiation postfix"?*

*Nigel Harding*

**A** I agree with you that the ins and outs of RISC OS can be difficult enough to understand without the use of jargon. As explained in an earlier Technical Query (RISC User 6:10), modules can perform many useful functions, largely invisible to the user. A particular feature of RISC OS is that it is possible for a module to be used for more than one purpose at a time, by creating a separate area of workspace for each purpose. Thus the module is initialiased more than once - each *initialisation* being referred to as an instantiation - but only one copy of the code is kept in memory. However, each instantiation of the module can have its own workspace.

Each instantiation of a module has an identifying name, referred to as the *postfix*, which is added to the end of the module name after a "%" character. For a module with only one instantiation, this will be called "Base".

A good example of multiple instantiations is the FileCore module. This implements filing system functions which are common to a number of different filing systems, and so one module with several instantiations is the most effective way of handling this. If you press Ctrl-F12 to get to the command line, then press Ctrl-N to switch on paged mode display followed by the command *Modules*, you will see a list of module names, among which will be *FileCore*. Depending on which filing systems are present in your machine you will see several entries for this module, for example:

```
FileCore%RAM
FileCore%SCSI
FileCore%ADFS
```

and so on. Each of these is a separate instantiation, and you will notice that while the address for the module code is the same in all cases, the workspace addresses are different. The instantiation postfix in each case is the name following the "%", e.g. "RAM".

*Alan Wrigley*

**Q** *Dear Sir*
*I am trying to reverse the colours of a black-on-white text display, as Edit does when selecting a block, by using an EOR plotting action, but it doesn't seem to work correctly in all modes. Is there a simple way to do this?*

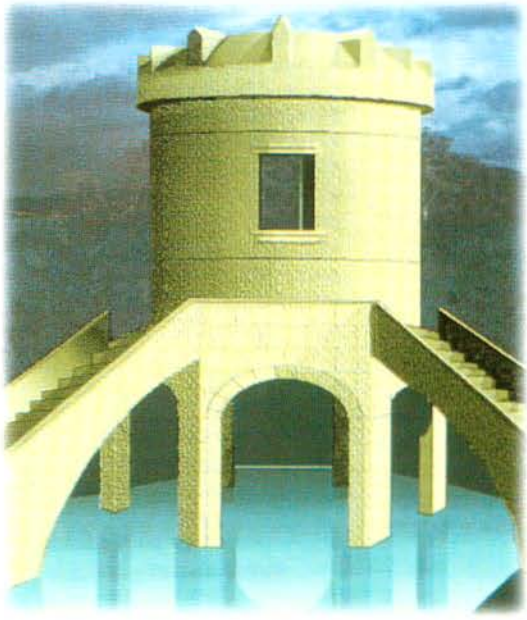
*A. Guthrie*

**A** The problem with this lies in the fact that the SWI "Wimp_SetColour" can only handle the 16 colours of the standard Wimp palette. While white and black correspond to colours 0 and 7 respectively in this palette, and can therefore be reversed by EORing either of them with 7, this is not necessarily the case in non-16-colour modes. In modes with less than 16 colours there is no problem, since if you specify a number greater than the highest available in that mode it will be scaled down; in other words colour 7 in a 2-colour mode will become 7 MOD 2, i.e. 1, while in a 4-colour mode it will become 7 MOD 4, i.e. 3. In both cases it will still be black. Zero is always white in any mode with 16 colours or less.When it comes to 256-colour modes the situation is more complex. Black is now 0 while white is 255. The "Wimp_SetColour" call can only specify one of the standard 16 colours, so you can't EOR the existing colour with 255. Without going into great detail, the simplest fix for this problem (for black and white) is use "OS_ReadModeVariable" to read the maximum logical colour in the current mode. If it is 63 (indicating a 256-colour mode) then EOR with 0, otherwise EOR with 7.

*Alan Wrigley*

PRO : Artisan 2

# TOWERING ABOVE THE REST



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Don't take our word for it see the reviews and previews – ProArtisan 2 has been completely rewritten. And just to show how good we think it is we are making you a special offer until 31st December 1993. Send us your program disk from **Artisan, Artisan 2** or **ProArtisan** with a cheque for £67.50 and we will send you a full **ProArtisan 2** pack – that's a full **50% trade in allowance** as a thank you for supporting Clares in the past.

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# C Notebook: Hints & Queries

*Compiled and linked by Lee Calcraft.*

## RANDOM ERRORS

As Ian Gordon has pointed out, I introduced an error into his random number generation hint (6:10). The line:

```
number=rand(100);
```

should have read:

```
number=rand()%100
```

The point is that the function *rand()* takes no parameters (unlike its Basic counterpart), and always returns a pseudo-random number between 0 and RAND_MAX. There are various ways to impose a more restrictive range on the resultant number, one of which is used in the above (which restricts the range to 0-99).

Incidentally, you could also use the random number function from the *bbc* library:

```
unsigned bbc_rnd(unsigned);
```

## INCONSISTENT POWERS

*P.S. Williams*

An error sometimes occurs when compiling code with the Acorn compiler which calls the function:

double pow(double x,double y)

in the *math* library (used to raise x to the power of y). In some situations the compiler generates an internal inconsistency error.

It is possible to avoid this by using the following function to call *pow()*:

```
double power(double x,double y)
{
    return pow(x,y);
}
```

## MONITORING LINE NUMBERS

*Lee Calcraft*

If during debugging you are trying to monitor which areas of code are being executed at any time, the use of a variation of the following may prove useful:

```
bbc_vdu(4);
printf("Now at line %d",__LINE__);
bbc_vdu(5);
```

Note the double underscore before and after the word *LINE*. This short routine prints to the Desktop the actual line number of the line being executed, and if you liberally sprinkle copies of it around your source, you can monitor progress as your code executes.

Remember though, that it is no use encapsulating this into a three-line debugging function, because it will just print the line number of the function definition, though it could be incorporated into a macro.

## SPECIFYING RISC OS 3 MESSAGES

*Thomas Down*

Although the *wimpt* library allows you to specify the version number you send to swi *Wimp_Initialise*, it provides no way to establish which Wimp messages you wish to be sent by RISC OS 3. However, it is possible to achieve this by calling swi *Wimp_AddMessages* after calling *wimpt_init()*, as follows:

```
#define Wimp_AddMessages 0x400f6

int wimpmessages[]={1,2,3,4,5,6,..,
0x400c0,0};

wimpt_wimpversion(310);
wimpt_init("My App Name");
os_swi1(Wimp_AddMessages,
(int) wimpmessages);
```

*wimpmessages* is a zero-terminated list of messages that your application is interested in. Note that 0x400c0 must feature in this list, or your submenus won't open.

## PARAMETER SUBSTITUTION IN MACROS

*David Spencer*

Normally, when the C preprocessor expands a *#define* macro, formal parameters are not replaced within quoted strings. For example:

```
#define result(res) printf ("result: res\n")
```

would always print:

```
result: res
```

regardless of the value of *res*. However, if a hash is put in front of the formal parameter in the substitution, it is replaced by the actual argument in quotes. For example, if we use:

```
#define result(res) printf ("result: " #res
"\n")
```

then a subsequent line:

```
result(ERROR);
```

would expand to:

```
printf ("result: " "ERROR" "\n");
```

The double quotes are removed automatically to give:

```
printf("result: ERROR\n");
```

Obviously, this allows variable text to appear within strings in a macro.

*Please send us your C hints - all published hints will be paid for.*

# Beat the VAT Man

*Donald McRae's short program listed here will do all the work for you in completing your VAT returns.*

Many small businesses face the regular chore of compiling their VAT returns. The purpose of the short program listed here is to provide an easy way of doing this in the style required by the authorities. The program is not multi-tasking - it hardly needs to be - but is already in use regularly by several small businessmen in the author's home town. Indeed, the program is simplicity itself, but that also means it is easily modified for all manner of similar form filling purposes. The headings are easily identifiable in the program and may be changed as required.

| DATE | SUPPLIER | TOTAL | ZERO | STD | EXPENSE | VAT |
|---|---|---|---|---|---|---|
| 03/11/1 | Crosbie | 127.98 | - | - | 111.29 | 16.69 |
| 13/11/2 | Lynstat | 74.19 | - | - | 64.51 | 9.68 |
| 25/10/3 | Lindsay | 404.23 | 404.23 | - | - | - |
| 22/10/4 | Lindsay | 301.73 | 301.73 | - | - | - |
| 29/11/5 | Lindsay | 431.44 | 431.44 | - | - | - |
| 26/11/6 | Lindsay | 379.56 | 379.56 | - | - | - |
| 30/11/7 | Lindsay | 220.30 | - | 191.52 | - | 28.78 |
| 23/11/8 | Lindsay | 129.47 | - | 112.59 | - | 16.88 |
| 03/11/9 | Crosbie | 127.98 | - | - | 111.29 | 16.69 |
| 13/11/10 | Lynstat | 74.19 | - | - | 64.51 | 9.68 |
| 25/10/11 | Lindsay | 404.23 | 404.23 | - | - | - |
| 22/10/12 | Lyndsay | 301.73 | 301.73 | - | - | - |
| 29/11/13 | Lyndsay | 431.44 | 431.44 | - | - | - |
| 26/11/14 | Lindsay | 379.56 | 379.56 | - | - | - |
| 30/11/15 | Lyndsay | 220.30 | - | 191.52 | - | 28.78 |
| 23/11/16 | Lyndsay | 129.47 | - | 112.59 | - | 16.88 |
| 03/11/17 | Crosbie | 127.98 | - | - | 111.29 | 16.69 |
| 13/11/18 | Lynstat | 74.19 | - | - | 64.51 | 9.68 |
| 25/10/19 | Lindsay | 404.23 | 404.23 | - | - | - |
| 06/04/20 | George | 54.15 | 54.15 | - | - | - |
| 27/04/21 | Xpress | 45.44 | - | 38.67 | - | 6.77 |
| 26/11/22 | Lindsay | 74.19 | - | - | 64.51 | 9.68 |
| 26/11/23 | Lyndsay | 220.30 | - | 191.52 | - | 28.78 |
| 27/11/24 | Crosbie | 127.98 | - | - | 111.29 | 16.69 |
| 27/11/25 | Lynstat | 74.19 | - | - | 64.51 | 9.68 |
| 26/12/26 | Lindsay | 379.56 | 379.56 | - | - | - |
| 28/11/27 | Lindsay | 400.00 | 400.00 | - | - | - |
| 27/11/28 | Xpress | 45.44 | - | 38.67 | - | 6.77 |
| 29/11/29 | Lyndsay | 415.15 | 415.15 | - | - | - |
| 30/11/30 | George | 54.15 | 54.15 | - | - | - |
| Totals | | 6634.75 | 4741.16 | 877.08 | 767.71 | 248.80 |
| Columns 4,5,6,7 | | 6634.75 | | | | |

Page 1

**Part of sample printout**

Type in the program and save it as a file of type Basic. You can either leave the Desktop and select Basic to do this, or use an editor like Edit or DeskEdit to enter and save the program. All the data required by the program each time it is run is included in the form of DATA statements from line 400 onwards. Each line of data corresponds to an entry on the VAT return, comprising a date, the name of the supplier, the total amount charged, the amount excluding VAT (zero and std. rated), the expense and the VAT charged. The format can be seen from the typical DATA statements included at the end of the listing, and by reference to the sample printout. Note that any redundant entries are represented by zeros. You will also need to modify lines 130 to 180 to reflect your own business name and address.

When run, the program asks which page you want. If your return occupies more than one page, the data for each page will need to be entered in turn into the data statements. You specify which page of your return it is when running the program and this is printed at the foot of that page.

You will also need to ensure that the number of DATA statements (entries) is reflected in the value controlling the FOR-NEXT statement at line 270.

One final piece of advice - if your printer fails to advance the paper after each line of print, then including the command:

```
*Ignore
```

after line 80 will probably cure this, or change the printer's DIP switches to force the printer to output a linefeed character every time the computer sends out a Return. If you are not using a character printer, then spool the output to a file first, and then print the file using a suitable printer driver.

*Note: the listing shows only ten lines of data, as an example. The version on the magazine disc contains additional sample data.*

```
  10 REM Program   VAT
  20 REM Version   A1.0
  30 REM Author    Donald McRae
  40 REM RISC User December 1993
  50 REM Program   Subject to Copyright
  60 REM           Not Public Domain
  70 :
  80 MODE0
  90 VDU19,0,7;0;:VDU19,1,0;0;
 100 Vattotal=0:Totaltotal=0:Zerototal=
0
 110 Stdtotal=0:Expensetotal=0:
 120 VDU14:@%=&2020A
 130 INPUT"Which page do you want? "Pag
e
 140 INPUT"Do you want a printout? "Rep
ly$
 150 IF Reply$="Y" OR Reply$="y" THEN V
DU2
 160 CLS:PRINT''
```

*Continued overleaf*

# WRITE - BACK

## A PAT ON THE BACK

*I was pleased to see an article about the production and use of maps in geography in your November issue (RISC User 7:1). The production of maps has been part of my teaching for several years, and it has been made easier by the use of first* **Draw**, *then* **Draw+**, **Artworks** *and the recently released* **Hatchback** *(for which I produced the example maps incidentally). Together I find these pieces of software, and a scanner, enable me to produce all the maps I need. The one problem with producing maps on a computer, not appreciated by those who have not done it, is the amount of time needed.*

*The availability of maps as clip art from a variety of sources (Micro Studio, Dec_Data, and 4Mation as smArt files) speeds up the process as all that needs to be added are the relevant details. The ability to add the locations, names, a key and any required shading quickly and easily using Draw etc. means that maps can be readily customised to meet exact requirements. The production of a local map, or of a map which shows only the names of countries, cities, rivers or seas needed for a particular task, reduces the amount of time spent examining an atlas. The use of an atlas cannot, however, be neglected, and it is useful to get pupils to produce maps on the computer.* **Myworld** *from SEMERC provides a way for less able pupils to label maps successfully.*

*The one aspect of maps and mapping which at present is missing from the Acorn scene is a geographical information system - let's hope that the one being produced by A.U.Enterprises will fit the bill. Please pass my thanks on to Jeff Davies for a worthwhile article.*

***Roger Nelson***

If readers know of any other sources of base maps, then please let us know and we can publicise the information for the benefit of other readers.

## RISC USER - A PERSONAL VIEW

*I refer to the letter in RISC User 6:6 from Richard Lancaster. I share his views concerning the content of your magazine, and after reading the content of issue 10 of the same volume I feel compelled to write.*

*This issue contained very little in the way of technical advice or programming tutorial, the vast majority being given over to software and hardware tests.*

*I am a convert from the days of the Electron and Master 128 days, and enjoyed reading the BEEBUG magazine which gave useful advice and useful programs. Now that I have upgraded to an Archimedes I am not sure that I have done the right thing.*

*It may be that I am in the minority in wanting the content of the magazine that I require, but I would value a survey of readers to see what the majority want. If I am still in the minority then so be it.*

***A.J.Barton***

This is an issue which has been raised before, and as before it is nearly impossible for any magazine to satisfy all of its readers all of the time. We do also carry out surveys of readers. However, the fact that the Archimedes is technically a very much more sophisticated and demanding machine than the old BBC micro has, I believe, persuaded many more users these days to concentrate on using their computer rather than programming it. Despite this, we do endeavour to present a range of technically oriented articles in each issue, and the recent Wimp Topics series and the new Desktop C series are evidence of our commitment to such readers while maintaining a broadly based magazine with much of interest to all Archimedes users.

## SPEEDING UP THE RESULTZ

*I was disappointed with the conclusions about the speed of Resultz (review in RISC User 7:1). On recalculation we've put in considerable effort to make Resultz fast and improve on PipeDream. I don't believe the figure of 12% (quoted in the review) is a representative one; but it does depend very much on the size and type of spreadsheet used. Many of our power PipeDream users have reported substantial speed improvements (more like 100%).*

*The figure of four times slower than PipeDream at loading is VERY misleading. When loading a sheet in its own format, Resultz doesn't need to do a recalculation (PipeDream does), and thus is usually faster than PipeDream at loading, though loading a PipeDream file into Resultz may well be slower.*

*We have had some problems with the PipeDream loader built into Resultz. This is to do with adding Text style regions, which makes the sheet slow to convert, slow to load and slow to display. We've fixed the problem in Fireworkz and in the latest version of Resultz.*

*The new version of Resultz (version 1.07) also includes document scaling and print-to-fit, and also a Search and Replace command, plus loads of other improvements. It's available as a free upgrade: just send an SAE with the master program and examples discs.*

*Fireworkz is now available too. A Resultz user can upgrade for the difference in price (£50 plus VAT plus £3 p&p). Fireworkz has all the features of Wordz and Resultz, plus live integration, and still only takes 896K of memory to load and run.*

***Mark Colton, Colton Software***

Alan Highet, who reviewed Resultz for RISC User has commented that the speed improvement of 12% which he quoted on recalculation may be untypical, but feels that the claim of 100% improvement is optimistic. Much depends on the nature of the spreadsheet, and the use of styles in Resultz can have an adverse effect on the speed of recalculation when information is re-displayed in each cell. As far as loading time is concerned, Alan has now had time to conduct more extensive tests, from which he deduces that loading times between Resultz and PipeDream are largely comparable, but confirms that the example spreadsheet used in the review, converted from an existing PipeDream sheet, was subsequently slower at reloading into Resultz. We expect to make spreadsheets the subject of a future RISC User survey, which we have asked Alan to undertake for RISC User, and comparative timings will be a feature of that survey when published.

***NOTE: Suppliers quoted in Write-Back can be contacted as follows:***

**Computer Concepts (Artworks),**
**Gaddesden Place,**
**Hemel Hempstead,**
**Herts HP2 6EX,**
**tel. 0442 63933.**

**4Mation (Hatchback, smArt),**
**14 Castle Park Road,**
**Barnstaple,**
**Devon EX32 8PA,**
**tel. 0271 25353.**

**NW SEMERC (Myworld),**
**Fitton Hill CDC,**
**Rosary Road,**
**Oldham OL8 2QE,**
**tel. 061 627 4469.**

**A.U.Enterprises,**
**126 Great North Road,**
**Hatfield,**
**Herts AL9 5JZ,**
**tel. 0707 266714.**

**Dec_Data (clip art),**
**60 Danes Road, Exeter EX4 4LS.**

**Micro Studio (clip art),**
**22 Churchgate Street, Soham,**
**Cambs CB7 5DS,**
**tel. 0353 720433.**

**Colton Software (PipeDream, Resultz, Fireworkz),**
**2 Signet Court, Swanns Road,**
**Cambridge CB5 8LA,**
**tel. 0223 311881.**

## Beat the VAT Man (continued from page 66)

```
  170 PRINTTAB(29);"Mitchell's VAT retur
n"
  180 PRINT"   Mitchell's,"
  190 PRINT"   46 St Margaret's St,"
  200 PRINT"   Kirkcudbright,"
  210 PRINT"   DG6 4AF."
  220 PRINT'TAB(3);STRING$(70,"*")
  230 PRINT"   DATE";TAB(10);"SUPPLIER";
TAB(25);"TOTAL";TAB(35);"ZERO";TAB(45);"
STD";TAB(53);"EXPENSE";TAB(66);"VAT"
  240 PRINT TAB(3);STRING$(70,"*")
  250 FOR K=1 TO 30
  260 READ Date$,Supplier$,Total,Zero,St
d,Expense,VAT
  270 PRINT TAB(3);Date$;TAB(12);Supplie
r$;TAB(19),Total;
  280 IF Zero=0 THEN PRINT TAB(36);"-";E
LSE PRINT TAB(30),Zero;
  290 IF Std=0 THEN PRINT TAB(46);"-";EL
SE PRINT TAB(40),Std;
  300 IF Expense=0 THEN PRINT TAB(56);"-
";ELSE PRINT TAB(49),Expense;
  310 IF VAT=0 THEN PRINT TAB(65);"-" EL
SE PRINT TAB(60),VAT
  320 Vattotal=Vattotal+VAT:Totaltotal=T
otaltotal+Total:Zerototal=Zerototal+Zero
:Stdtotal=Stdtotal+Std:Expensetotal=Expe
nsetotal+Expense
  330 NEXT
  340 PRINT'STRING$(70,"*")
  350 Xtotal=Zerototal+Stdtotal+Expenset
otal+Vattotal
  360 PRINT TAB(3);"Totals";TAB(19),Tota
ltotal;TAB(30),Zerototal;TAB(40),Stdtota
l;TAB(50),Expensetotal;TAB(60),Vattotal
  370 PRINT TAB(3);"Columns 4,5,6,7 ";TA
B(19),Xtotal
  380 @%=10
  390 PRINT TAB(35);"Page ";Page
  400 VDU3:@%=&90A
  410 END
  420 :
  450 DATA03/11/1,Crosbie,127.98,0,0,111
.29,16.69
  460 DATA13/11/2,Lynstat,74.19,0,0,64.5
1,9.68
  470 DATA25/10/3,Lindsay,404.23,404.23,
0,0,0
  480 DATA22/10/4,Cameron,301.73,301.73,
0,0,0
  490 DATA29/11/5,Jackson,431.44,431.44,
0,0,0
  500 DATA26/11/6,Cameron,379.56,379.56,
0,0,0
  510 DATA30/11/7,Johnson,220.3,0,191.52
,0,28.78
  520 DATA23/11/8,Lindsay,129.47,0,112.5
9,0,16.88
  530 DATA03/11/9,Crosbie,127.98,0,0,111
.29,16.69
  540 DATA13/11/10,Lynstat,74.19,0,0,64.
51,9.68
```

## Investigator III £49.95

The new version of the highly successful Investigator II is a considerably expanded and improved package.

- Now includes not only the most powerful disc backup routines available but also a collection of other useful programmes:-
- A disc recovery package that will fix broken directories, undelete accidentally deleted files and lets you directly edit the disc contents - works with hard drives, floppy drives or other legal filing systems.
- A hard drive backup program that will backup from the hard drive - or other filecore system - to either floppy, syquest, tape streamer or other destination. The package is fully configurable and can backup just the changed files, by date or everything.
- A virus killer and detector that will detect and kill all current viruses. Warns you if an unauthorised attempt is made to access files such as !Boot files and will remove any existing infections for you. Configurable to be active at all times or only scan new discs.
- This combination of packages makes Investigator III the best disc utility suite available on the Acorn and makes sure that you won't get caught out by damaged data!

## Desktop Tracker £49.95

"...programming at its best" - Acorn User January 1993

Continuing in the tradition of the immensely popular Tracker package, use Desktop Tracker to create fantastic tunes with no extra hardware.

Desktop Tracker has been completely rewritten to incorporate many new and innovative features:

- Up to 16 tracks
- Fast playroutines
- 4 effects per note on each track, allowing up to 64 simultaneously
- Real time effects include pitch bend, arpeggio, volume slide, phasor effects, note retriggering and many more.
- Powerful editing facilities, including transpose, cut and paste, echo and more.
- Score display allows you to see your tunes and samples in traditional stave notation format.
- Public Domain playroutines and jukebox to allow tunes to be played on any machine.

## MIDI/Sampler Interface £79.95

A high quality sound sampler and Acorn compatible MIDI interface.

- Fits into the normally unused Econet socket - it does not waste an expansion slot.
- Max. sample rate 50Khz.
- Perfect for educational use - can sample from a wide variety of inputs - CD, HiFi, Radio, Microphone etc.
- All cables and software supplied.
- User friendly Pulse sampling software provided.

## Printer Port Sampler £39.95

Compatible with all Acorn machines - plugs into the Parallel Printer Port.

"Pulse" software provided includes the following editing features - fade in/fade out, over and under sampling, zoom in/zoom out, save and edit marked section, play forward or backwards at normal or high speed.

Save in various file formats - Armadeus, Tracker, Sound Module.

## QD Bug £69.00

"....a must for assembler programmers, and comes very highly recommended" Archimedes World May '93. (overall rating 95%).

QD Bug is the definitive debugger for all ARM coders both beginner and expert. It has many powerful features including: single stepping, skip and force instructions, SWI history lists and trapping, customised flexible windowing system, view BASIC sources and text files from within the program, keypress emulation with macro record and playback.

Please contact us for further details on QD Bug.

## IDE & SCSI Solutions

We are one of the largest suppliers of Acorn extra drives and supply a range of drives - the sizes below are just a selection. If you require other sizes (either larger capacity or 2.5" drives suitable for the A3020) please contact us.

### A5000 / A4000 IDE Systems

These drives can either be installed alongside your existing drive or as a replacement for it. All drives are supplied with the necessary cables and fitting instructions. Drives supplied are high quality Conner or Quantum drives.

170Mb £189
250Mb £289

Call us for latest prices - they could be lower!

### SCSI Systems

All systems are CDFS and Acorn compatible. Cards are available in full size 16-bit format for the A5000/540/400/300 series or the smaller size for the A3000/3010/3020/4000 series. All the cards are very fast - top transfer speeds in excess of 2.8Mb per second - contact us for exact details of performance and specification if required.

170Mb including card and all cables £289
240Mb including card and all cables £389

For use with A3000/3010/3020/4000 series add £75 for an external box for the drive.

CONTACT US FOR DETAILS OF OUR NEW LOW COST CD-ROM

Please add £9.00 delivery for hard drives and £2.00 for all other products.

All prices exclude VAT

# the range

for more info. and orders contact:-
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Albany House
Oving Road, Chichester
West Sussex PO19 4BH

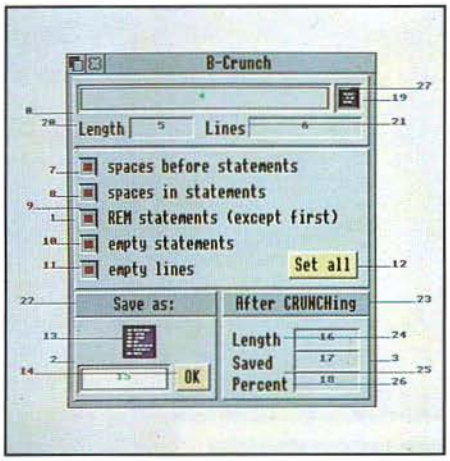
Tel: (0243) 531194
Fax: (0243) 531196

Products designed & developed by:

Vertical Twist

# Icon Labeller

*by Graham Crow*




**After using Iconlab . . .**

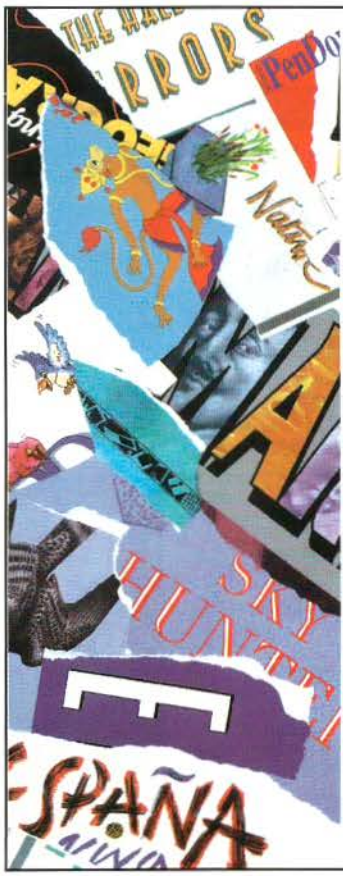
The application *IconLab* is a very useful programmer's utility for capturing a window and labelling or renumbering its icons. No longer will you have to scribble down icon numbers for the templates you design.

Simply use the mouse or designated function key to select a window to label, and *IconLab* will cut the window as a sprite and label all icons with their correct numbers. Icon numbers will be placed within each icon where possible, or aligned horizontally or vertically around the window, so that all icons in a window can be tidily labelled. Switching off all labelling options provides a convenient method of grabbing entire windows for help files or manuals. Windows converted into sprites can be saved from within *IconLab*, and loaded back into *IconLab* on any later occasion.

To renumber icons within a window, load the template file containing the window just labelled by dragging it to *IconLab*, and renumber the icons as you please. Renumbering is performed simply by clicking on the icon numbers. The modified template file can be resaved when renumbering is complete.

*IconLab* also has an options menu so that its functions can be customised by the user.

*For reasons of space, both applications described here are supplied only on this month's magazine disc.*

# Education Software Programming Opportunities

Longman Logotron is looking for RISC OS programmers with the skills and aptitude to work on developing exciting educational applications for younger children.

An appreciation of educational needs, visual awareness, graphical expertise and programming ability are all equally important qualities.

We can offer you the opportunity of working with one of the largest and most successful publishers in UK education, with all the marketing benefits and development resources you would expect.

If you think you might be the kind of person we are looking for, Please contact us now.

Some examples of previous programming work would be very helpful.

Nicola Bradley
Longman Logotron
124 Cambridge Science Park
Milton Road,
Cambridge CB4 4ZS

# Boffin

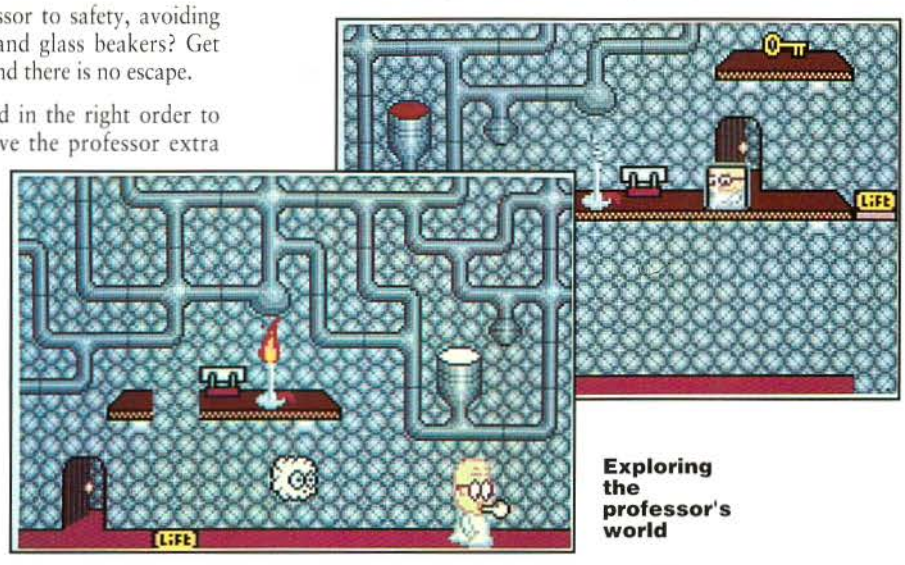
*by Philip Roberts*

To keep you, your family and friends amused and entertained over the Christmas break, we bring you *Boffin*, a high quality graphical adventure game from the author of *Wraith* (see the Volume 6 Special Disc). *Boffin* is a challenging ladders and levels game containing dozens of puzzles that must be solved in the right sequence to complete each level.

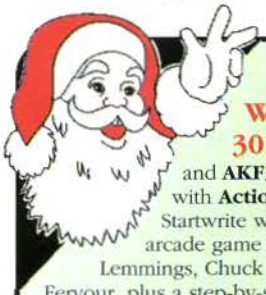
Can you guide the professor to safety, avoiding the acid drops, baddies and glass beakers? Get caught in a glass beaker and there is no escape.

Objects must be collected in the right order to perform experiments, give the professor extra power or open doors. Bunsen burners must be used to heat some liquids before collecting them in the flask for mixing, pouring or drinking.

Explore and master the 20 levels in this highly original game and become the hero of the Acorn world this Christmas.




**Exploring the professor's world**



## Christmas Competition

**WIN AN ACORN 3010 COMPUTER** and **AKF30 monitor** complete with **Action Pack** including Startwrite word processor, Zool arcade game and demo versions of Lemmings, Chuck Rock, Superpool and Fervour, plus a step-by-step audio training guide to RISC OS 3, all kindly provided by Acorn Computers Ltd.

We are also offering five runner's up prizes consisting of a year's free subscription to the RISC User magazine disc.

**The competition** - it's easy - just locate and mark the words listed below in the word search puzzle. Cut this out from the magazine, or photocopy the page if you wish, and return it to: *RISC User Christmas Competition, 117 Hatfield Road, St Albans, Herts AL1 4JS* to arrive no later than *10th January 1994*. Please include your full *home address and a daytime telephone number.*

All correct entries will be entered into a prize draw. The first correct solution to be pulled out will win the first prize, and the next five correct solutions will win one of the runner's up prizes.

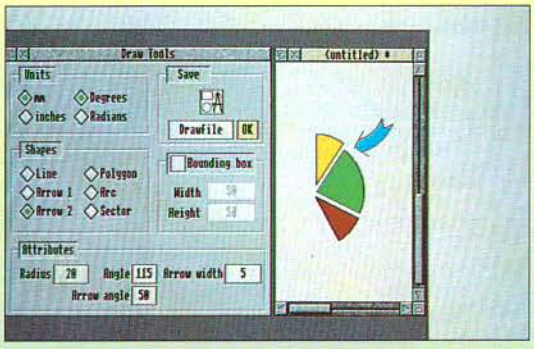
The competition is open to readers of both RISC User and BEEBUG magazines. Employees of RISC Developments Ltd., Beebug Ltd. or Acorn Computers Ltd. are not elligible to enter.

E O U Y V C R Y S T A L M A Z E M A Q L
I V T O T W V O D B R W S Y Q U E S T M
J A P S F Y X Y A L M G O E L R S R K T
E T H U G Z P B D P P O C K E T B O O K
D I O H E N J I L O R L A B L G E L O W
P O T T Z O I M P Y S G N I H P R O M N
A N O E G L I M E E C P J M S C N M J R
C A C S M E B R M O D M A F M J G W B E
L C D U R A N H X E Z R I H V L G K O V
C T G O Z G O K W Q L A E U R Y V V F E
G I R H B I K O O X H O O A M M E Y F L
B O W D S E D E M I H C R A M L Q U I A
D N M E P U K R U I E B X T M U D S N T
J P G T S O C S I R P Z S I C D B P B I
G A N N E E U R E K A K Z D W N N O B O
C C Z U E D J B O Y U Q R E D K Y Q S N
W K S A W Y N S W S K R O W O I D U A R
C I P H J N R O C A V D O J Z F P U D W
E E B F T I D E K S E D J X X G S T H G
H T U E L S E E J E D L N R C U Z H H O

ACORN
ACTIONPACK
ARCHIMEDES
AUDIOWORKS
BOFFIN
CRYSTALMAZE
DESKEDIT
EUREKA
HAUNTEDHOUSE
LEMMINGS
MORPHING
OVATION
PHOTOCD
PIPEDREAM
POCKETBOOK
REVELATION
RHAPSODY
RISCOS
SLEUTH
SYQUEST

# RISC *user* Volume 6 Special Disc

*The latest in our highly acclaimed series of RISC User Special Discs is now ready. Our aim with every Special Disc is to put together an interesting selection of the best applications from the previous ten issues of RISC User, augmented as always with a number of totally new and original items. Furthermore, previously published items will often have been updated in the light of user feedback.*




## Draw Tools

This powerful application is designed to work alongside Draw, Vector, ArtWorks or any other CAD package. It provides an 'object' toolbox for these applications for creating circles, arcs, lines etc, as well as straight and curved arrows. Based on an application originally supplied on the RISC User disc, Draw Tools has been almost totally rewritten to provide more functions and much more intelligent user interface.

## Font Manager

An excellent application for managing the many fonts now available on the Archimedes in a simple and effective way.

## Stencil

Create a multitude of stencil affects with your Draw files with the help of this application.

## Guitar Player

A highly playable implementation of a guitar. Create and store chords; use the mouse to strum the strings; play along with RISC.

## Outline Fonts

Two completely new and original outline fonts - Dynamic Shaded and Rob Roy, in normal and italic styles.

## Pinboard Backdrops

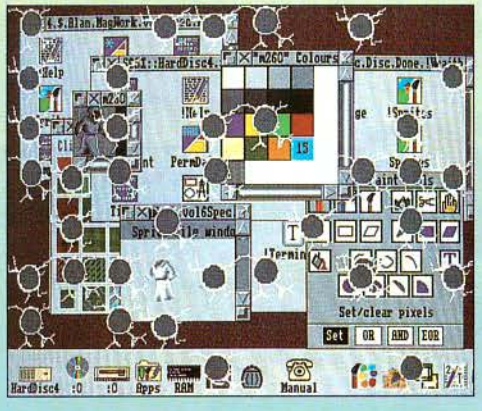
A selection of mood backdrops for use with the Desktop Pinboard

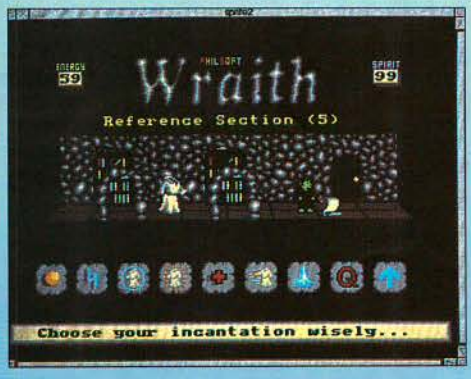
## Terminator

A brand new novelty which produces startling consequences when you come to the end of a session.

## Harry Organiser

RISC User's own personal organiser now updated for the Volume Six Special Disc.




## Wraith

A highly original and challenging arcade adventure game for hours of nerve-wracking fun and entertainment.

## ScanDisc

Use this updated application to create ArcScan compatible and ASCII files of all your favourite discs. Ideal for cataloguing and indexing sprites, clip art, PD discs etc.

## FilerMate

A handy application which provides much more convenient access and control of many Filer functions on the Desktop.

Complete **Volume 6 ArcScan Index** for RISC User.

*Full supporting Help System*


**RISC Developments Ltd**

117 Hatfield Road, St Albans, Herts AL1 4JS
Tel. 0727 840303 Fax 0727 860263.


**Special Offer** to **RISC** *user* subscribers

*Until 31st December the Volume 6 Special Disc is available for* **£6.95** *(inc.VAT and p&p)*

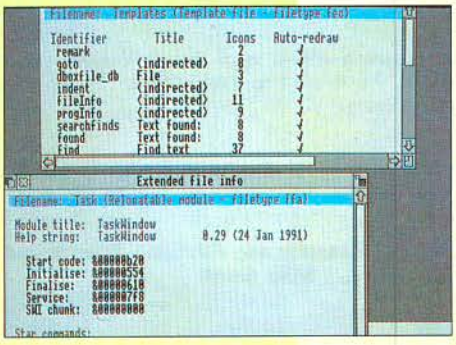
**Stock code: PV6S**

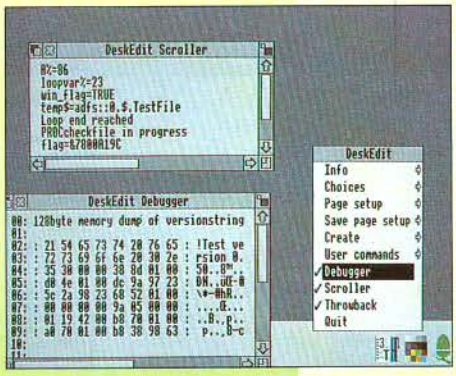
*Normal members price will be £10.95 (inc.VAT and p&p)*

**Non members price £15.95 (inc. VAT and p&p)**

# More editing power with . . .

# DeskEdit 3




DESKEDIT 3 IS A SUCCESSOR TO THE POPULAR DESKEDIT 2 PROGRAM AND TEXT EDITOR, AND AT NO INCREASE IN PRICE. DESKEDIT 3 THUS OFFERS EVEN MORE VALUE FOR YOUR MONEY THAN EVER BEFORE. DESKEDIT 3 RETAINS ALL THE FEATURES OF ITS POWERFUL PREDECESSOR, WHILE ADDING MANY MORE. BRAND NEW FEATURES INCLUDE:

- Complete 20-entry **Desktop debugging** window for use with Basic or C.
- Independent **scrolling window**. Again any text or data can be displayed in this window by using one of the supplied Basic or C functions.
- A new set of **20 invisible markers** are now provided with each window, making it even easier to find your way around your code.
- New views of all DeskEdit windows now have full functionality.
- **New Function Locator.** Press Ctrl-A and you will be taken to the definition of that function,and can then flip backwards and forwards between definition and call.
- **Extended File Info.** Dragging a file to the DeskEdit icon with Alt-Shift pressed gives extended info on files including Templates files, sprite files, modules, PCX files, and Basic programs.
- Auto indents are now implemented for Basic as you type.
- **Overrides.** A new user-choices file called overrides allows the user to override a number of preset features of DeskEdit.
- **Input Filter.** An automatic input filter can be invoked to automatically normalise files coming from a PC or similar environment, and reinstate them when they are saved.
- **Display Width**. This is now saved with extended saves, and is automatically brought into play on reloading the file.
- **C Syntax Checker**. This has been reworked, and is now even more effective at spotting mistakes as you type, including much more comprehensive multi-line checking.
- A new optional **safety-net saver** automatically retains on disc a separate copy of the latest file overwritten during a DeskEdit save.
- Plus numerous other small enhancements.

DeskEdit 3 is available now (product code **PDE3**).

**Price: £27.19 ex. VAT (RRP)** **£22.94 ex. VAT (RISC User)**

Upgrade from DeskEdit 1 (code PDEX) £8.47 ex. VAT
Upgrade from DeskEdit 2 (code PDEU) £5.00 ex. VAT
Post & packing is £1 for upgrades, £2 for the complete package.

RISC developments

**RISC Developments Ltd**
117 Hatfield Road, St Albans, Herts AL1 4JS Tel. 0727 840303 Fax 0727 860263

# Subscription

RISC User is available only on subscription at the rates shown below.

| Subscription Rates | RISC User Renewal | RISC User New |
|---|---|---|
| UK, BFPO, Ch.Is | £18.40 | £19.90 |
| Rest of Europe &Eire | £27.50 | £29.00 |
| Middle East | £33.50 | £35.00 |
| Americas & Africa | £36.50 | £38.00 |
| Elsewhere | £39.50 | £41.00 |

Please note that new subscription rates are £1.50 more than renewals.
All subscriptions, including overseas, should be in pounds sterling.
We also accept payment by Connect, Access ,Visa, Switch and official UK orders are welcome.

# Magazine Disc

The programs from each issue of RISC User, together with a number of substantial additional items, are included on a monthly 3.5" disc. This is available to order, or you may take out a subscription to ensure that the disc arrives at the same time as the magazine.

| Disc Subscription Rates | UK | Overseas |
|---|---|---|
| Six months subscription | £25.50 | £30.00 |
| Twelve months subscription | £50.00 | £56.00 |

Disc subscriptions include postage, but you should add the appropriate rate (see below)

# Back Issues

All issues are currently still in stock except Volume 1 Issues 4&5 magazines. All subject to availability. Please include postage when ordering.

| | Volume 1 | Volume 2 | Volume 3 | Volume 4 | Volume 5 |
|---|---|---|---|---|---|
| Magazine | £1.00 each | £1.20 each | £1.60 each | £1.90 each | £1.90 each |
| Disc | £2.00 each | £4.00 each | £4.00 each | £4.75 each | £4.75 each |

**Post & Packing**

Please add the cost of p&p when ordering. When ordering several items use the highest price code, plus half the price of each subsequent code.

| Code | UK, BFPO, Ch.Is | Europe Eire | Americas, Africa Mid East | Elsewhere |
|---|---|---|---|---|
| a | £1.00 | £1.60 | £2.40 | £2.60 |
| b | £2.00 | £3.00 | £5.00 | £5.50 |
| c | £3.10 | £6.50 | £10.50 | £11.50 |

* Please use stock code 'a' when ordering magazines and discs

# Discount for RISC User Subscribers

All prices listed *exclude* VAT but do not include post & packing. If in doubt please check by phone when placing your order.

| | | RRP | Discount Price | | | RRP | Discount Price |
|---|---|---|---|---|---|---|---|
| PAOMa | ArcOmnibus Games Disc | 12.68 | 8.47 | PFD3a | RISC User Fonts Disc 3 | 10.17 | 8.47 |
| PAS3b | ArcScan III | 13.57 | 11.02 | 0094b | Hard Disc Companion | 45.00 | 38.25 |
| PAL1a | ArcScan III Library Disc 1 | 8.47 | 6.77 | 0093c | Hearsay II | 75.00 | 63.75 |
| PAL2a | ArcScan III library Disc 2 | 8.47 | 6.77 | 0098b | Masterfile 3 | 49.00 | 41.65 |
| PBK1b | Basic Programmer's Toolkit | 15.28 | 12.72 | 0108c | Ovation | 99.00 | 84.15 |
| PCHWb | ChartWell | 25.49 | 21.23 | 0097b | Playback | 19.00 | 16.15 |
| PDE3b | DeskEdit 3 | 27.19 | 22.94 | PGLTb | PolyGlot | 16.98 | 12.72 |
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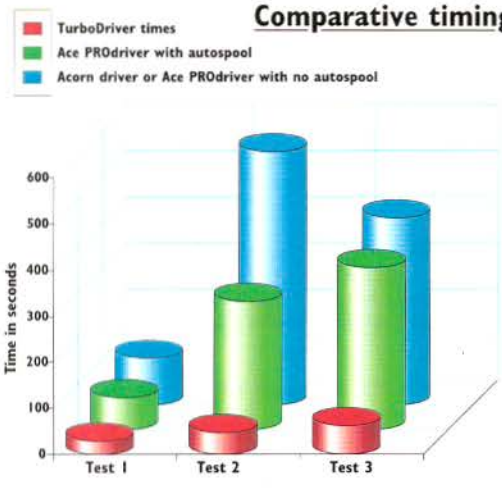


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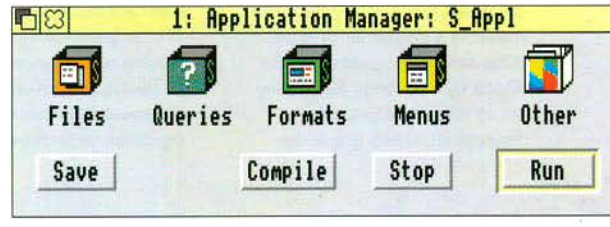


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